ELEMENT FIVE: FORECASTS OF AVIATION DEMAND

5.1 OVERVIEW

Arizona has witnessed tremendous growth over the past 20 years, and the next 20 promise to be filled with equal potential as the State epitomizes "sun belt" attractiveness. The State clearly enjoys an unusually strong mix of recognizable attributes that is nearly impossible to duplicate by other states across the nation. Tourism has been explosive, and business development has anchored the State with a strong outlook supported by growth in international trade.

The metropolitan areas of Phoenix and Tucson carry world-wide name recognition, the Grand Canyon and Colorado River communities remain top draws for tourism, numerous Old West towns perpetuate Arizona's appeal, and the State's diversified climate and scenery create an unmatchable variety of travel experiences. High tech industry has made Arizona its home, and the State remains well balanced with respect to employment mix and diversified sources of activity.

Forecasts of aviation demand have been prepared and are presented in this element to assist in the evaluation of the performance based needs of Arizona's aviation system over the next 20 years. The forecasts are organized in the following manner:

- Air Carrier
  - Enplanements,
  - Operations, and
  - Cargo and Mail.
- General Aviation
  - Registered Aircraft,
  - Based Aircraft, and
  - Based Aircraft Operations.

Previous Arizona Forecasts

Previous state level aviation planning efforts have been documented in Element One, *Introduction, Goals and Objectives, and Review of Existing Plans.* As reported, forecasts of statewide activity were prepared in Volume III of the 1988 State Aviation System Plan, and updated as a part of the 1995 State Aviation Needs Study. These forecasts have been an important source of background information in the development of the SANS 2000 forecasts.

Purpose of Forecasts

The State Aviation Needs Study (SANS) is a determination of the need for aviation investment in Arizona. Essential to that determination are forecasts of growth and the availability of future funds. Forecasts provide the basis for determining the type, size, location, timing, and financial feasibility of aviation facilities development. Consequently, forecasts influence virtually all phases of the system planning process. Because of the importance of the forecasting effort to the planning process, conservatism is important as exponential growth over 10-20 years can lead to unrealistic conclusions.

Philosophy of Forecasting

Forecasting is more than an extrapolation of past trends and the application of statistical measures to relate the future of aviation to the future forecasts of population and economic activity. It requires the application of judgement and an understanding of the market forces that affect and limit growth. Forecasting is particularly difficult for general aviation. Aviation activity is often influenced by the types of airport services offered for transient and based aircraft, and by the general business environment. In addition, factors such as vigorous local airport marketing, gains in sales and services, increased industrialization, changes in transportation mode preferences, or fluctuations in the national or local economy all influence aviation demand. The SANS 2000 demand forecasts are developed in accordance with national trends, and in context with the inventory findings, including local population, per capita income, and employment trends. National aviation trends and forecasts, used to provide a baseline of growth rates, are found in the FAA publication entitled *Aviation Forecast (FY 1998-2009).*

The SANS aviation demand forecasts have been developed using statistical techniques including regression analysis, market-share and trend-line series, as well as from an analysis of the Arizona general aviation pilot population. The statistical methodology was developed as part of the SANS 1995 study.

Exhibit 5-1 graphically provides an overview of the steps involved in forecasting aviation activity.

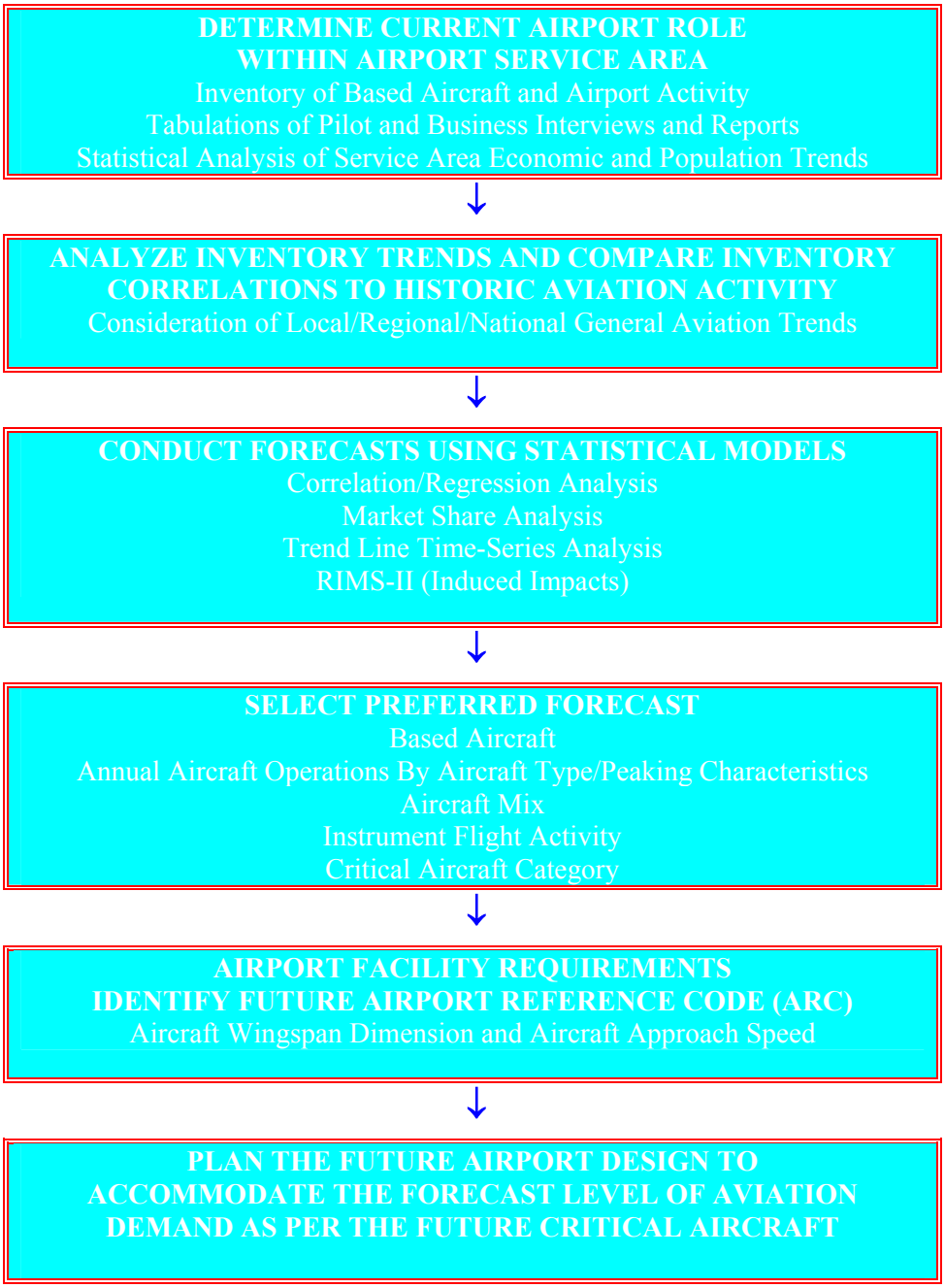
National Aviation Trends/Projections

Overall, the general aviation segment of the industry is expected to experience moderate growth (1.2% to 1.5%) during the next 10 years, and within the next 3 to 5 years is projected to return to the activity levels (fleet size, hours flown and active pilots) experienced prior to the 1990 general aviation industry downturn. The general aviation fleet, as a whole, is expected to grow in size, with future growth levels approximately proportional with the existing aircraft types (single, multi-piston, turboprop, turbine-jet).

The single-engine general aviation fleet is becoming more sophisticated, with a gradual increase in the fleet size, utilization, and pilot training. The recent infusion of new aircraft technology into general aviation has resulted in improved performance, more reliable and cost-effective single-engine airplanes, as evidence of the manufacturing of new production airplanes and various experimental aircraft.

Due to many factors, today there is a more sophisticated pilot population flying more advanced and demanding aircraft. Factors such as the recent cost escalation associated with recreational flying, coupled with higher liability and taxes for those who own, rent, and operate general aviation airplanes, has, overall, contributed to a higher proportion of business and itinerant aircraft operations relative to local pilot training and recreational activity. This trend has resulted in a reduction in private pilots, and a leveling-off of single-engine general aviation aircraft utilized used for recreational purposes.

EXHIBIT 5-1: ***Aircraft Forecasting Methodology***



Source: Aviation Forecast (FY 1998-2009)

There is recent optimism in the general aviation industry. More sophisticated and higher-value single and twin-engine aircraft are being manufactured, along with a corresponding increase in the number of advanced pilot ratings. The used aircraft market has remained strong, more affordable design and navigational technologies are available, experimental aircraft building has proliferated under new FAA certification, and the global sales of smaller general aviation aircraft has increased substantially.

In addition, national legislation passed in 1994 established an 18-year liability horizon for the design or manufacturing of general aviation aircraft and components. Combined, these events are anticipated to stimulate general aviation activity during the 20-year planning period.

Commercial aviation has undergone different dynamics. The structure of the commercial industry has changed, with the initiation of major airline hub-and-spoke operations, increasing numbers of code sharing regional carriers, and the continued success of no-frills operators such as Southwest Airlines and its imitators. Arizona has been in the middle of these changes, with major impacts on Phoenix, Tucson, and the other commercial airports. Phoenix has become the hub for America West, a major point for Southwest, and the focus of regional carriers, both code sharing and non-code sharing. Many of the other airports have become regional spokes for the code sharing carriers. The significant growth in enplanements during the last decade was the result.

5.2 FACTORS INFLUENCING COMMERCIAL SERVICE FORECASTS

In conjunction with SANS 2000, the Arizona DOT Aeronautics Division has been tasked with assessing the state's aviation system based on the outlook for the next five-, ten-, and twenty-year periods. The airline industry has witnessed a virtual restructuring in the 20 years since deregulation in 1978, and current events suggest that many substantial changes are yet to occur. How these changes will impact the cities within Arizona remains to be seen, so projections must be made by using both reasonable and realistic assumptions.

Given the dynamics of commercial aviation, it is critical to consider the key factors that impact passenger levels and airline operations today and into the future. In general, there are two extreme approaches to forecasting, the first being the true macro-level projections being made on a nation-wide level. These forecasts employ macro-economic factors such as growth in real GDP, propensity-to-travel factors, airline capacity expansion, disposable income, etc.

At the other end of the spectrum, detailed forecasts can be made for specific routes, by airline and by specific aircraft type. Airline planners are continually involved in this level of forecasting as they examine new route opportunities or perform analyses of aircraft fleet operations.

To meet Arizona's needs and provide guidance and direction for future planning, the SANS 2000 forecasts need to be somewhere in between. True macro projections tend to rely heavily on statistical modeling and trend analysis, often linked to nation-wide assumptions regarding growth of capacity and airline travel. Arizona's cities and commercial services probably won't follow simple national trends, nor will their futures be a simple extrapolation of their past experiences. Micro approaches will also fail to provide adequate planning guidance, since the exactness of

this method requires very specific assumptions that have a very short shelf life given changes in aircraft technology, mergers between airlines, and other significant factors.

To provide long-term forecasts that add value to the planning process, a balance between top-down and bottom-up approaches has been used. Each community deserves an independent review of air service opportunities, and ADOT requires information that is consistent with changes in the airline industry. For these reasons, forecasts were prepared reflecting the following factors.

Basic Categories of Airport and Community

Airports and their respective communities fall into approximately five or six basic categories on a widespread basis. Experience with markets across the nation suggests that within each category similar characteristics exist, as do similar challenges regarding the attraction and development of commercial air service. Likewise, the long-term outlook may also be similar within each category, reflecting unique factors that impact service and passenger activity.

Table 5-1 summarizes these categories, showing general characteristics and the factors that influence long-term expectations. For example, Phoenix Sky Harbor is listed as an international gateway, serving as a hub operation for major airlines. Phoenix shares many similarities with other hub cities, including facility constraint challenges, location in the state's largest metro area, and an ability to draw passengers who drive from smaller communities within the region. Although the mix of airlines is much different, Minneapolis-St. Paul International will largely be affected by many of the same factors long into the future, as will several other hub city airports.

At the other end of the scale, a market like Kingman also shares many traits with its peers across the nation. These cities suffer from loss of passengers driving to other airports, "competition" from other communities that are nearby (such as Laughlin-Bullhead), relatively small population masses that dictate the use of smaller turboprop aircraft, and challenges from airlines who have been systematically upgrading their fleets to larger planes. Communities in this category are facing challenges at an increasing rate even today, trying to solve current deficiencies in commercial air service through whatever creative means they can muster.

In the end, a forecast is not a personal statement of each community's relative value in the world of commercial air service - it is a summary of the challenges and factors that influence many cities in similar ways, tailored for the uniqueness of each individual situation.

TABLE 5-1: ***Commercial Airport Categories***

Category	City	Characteristics	Outlook/Forecast Factors
International Gateway	Phoenix	- Major Hub Operations - International Service - Draws drive traffic from smaller communities	- Facility Constraints - Bilateral Agreements - Airline Maturity - Local vs. Connecting Traffic - MSA Growth (Pick scenario consistent with matching factors)
Major Metropolitan	Tucson	- Strong Domestic Traffic - Multiple Carriers - Multiple Hub Services - Some Point to Point Services - Not Feeder Dependent	- Some Facility Issues - Proximity to Competition - Airline Maturity - New Route Opportunities (Possible strong growth)
Regional Commerce Centers	Flagstaff Yuma	- Possible Single Hub Today - Prop & Jet Mix Likely - Multiple Hubs in Future	- Geography - Fleet Decisions - Leakage Trends - Corporate Activity - "Tag" Operations (Guarantee of future service - More "upside" than "downside")
Small and Rural Community	Show Low Lake Havasu Prescott Sierra Vista Kingman	- Regional Service Only - "Tag" Service to Single hub - Some EAS contracts - Seasonal Markets - Tag Dependent - Often Single-Hub Service	- Vulnerable to Carrier Fleet decisions - Excessive Leakage - Carrier Reliability/Completion Factor - Alternative Transportation Modes - Proximity to Alternative Air Service - Small mass overshadows strong business travel/high yield traffic (Results could hinge proactive efforts of community leadership)
Destination Markets	Grand Canyon Bullhead City Page	- Traffic and/or Service: - Not related to population - Primarily "in-bound" - Group Travel - Short Stays - Low Fares/Yield - Seasonal Influences	- Challenges to attracting scheduled service - Periodic charters - Tour packaging - Hotel accommodations

Source: Kiehl-Hendrickson Group - 2001

Population vs. Passengers

As a rule of thumb, it is common to expect that annual passenger enplanement demand for a given city is approximately equal to the population base being served. This one-to-one ratio is not true for all markets, but serves as a test of reasonableness across the industry. Results tend to follow the logic that a larger population base creates more passenger activities, unless factors in the environment alter that relationship.

Table 5-2 provides some examples of mid-sized markets whose populations range from approximately 100,000 to 300,000. As expected in a normal distribution of markets, some produce relatively few passengers for their size, while others clearly exceed the one-to-one relationship. One example of high passenger volumes in this group of cities is Amarillo, Texas, which enjoys some low-fare airline service and the stimulative affect that follows.

TABLE 5-2: ***Population vs. Passenger Enplanements***

City	MSA Population	Enplanements	Enplanements Per Capita
Peoria, IL	346,000	218,272	0.63
Appleton, WI	342,000	261,259	0.76
Huntsville, AL	330,000	495,474	1.50
Evansville, IN	290,000	246,686	0.85
Savannah, GA	285,000	693,871	2.43
Duluth, MN	239,000	104,028	0.44
Green Bay, WI	215,000	324,783	1.51
Ashville NC	212,000	277,731	1.31
Amarillo, TX	210,000	434,821	2.07
Springfield IL	205,000	84,903	0.41
Burlington VT	192,000	427,897	2.23
Cedar Rapids, IA	182,000	442,257	2.43
Champaign, IL	168,000	138,845	0.83
Fargo, ND	167,000	119,223	0.71
St. Cloud MN	161,000	19,732	0.12
Sioux Falls, SD	157,000	340,068	2.17
Charlottesville, VA	145,000	160,230	1.11
Bloomington IL	141,000	173,091	1.23
Wichita Falls, TX	137,000	53,397	0.39
Texarkana, AK	127,000	35,099	0.28
Sioux City, IA	122,000	89,822	0.74
Rochester, MN	114,000	154,877	1.36
Grand Forks, ND	104,000	84,944	0.82
Bismarck, ND	91,000	119,223	1.31
Dubuque, IA	89,000	41,719	0.47
TOTALS	**4,771,000**	**5,542,252**	**1.16**

Source: FAA Air Traffic Activity (0 thru 2000)

It should be noted that this one-to-one relationship is only an initial baseline, and is dependent on a community's ability to attract and retain satisfactory air service that meets the needs of business and leisure travelers. Many smaller communities struggle with this retention, as addressed by the following discussion.

For purposes of the SANS 2000 project, population projections were taken from the Arizona Department of Economic Security (DES). These forecasts are for incorporated cities, and growth rates were applied to metropolitan statistical areas where applicable for purposes of calculating enplanements per capita.

Traffic Leakage To Other Airports

Traffic "leakage" is defined as passengers who drive to another airport to begin their travel. If passengers drive from Page to Flagstaff, for example, and fly out of Flagstaff, this behavior understates the true demand from Page, overstates the demand from Flagstaff, and can influence airline planning decisions regarding service levels to both communities. Leakage tends to be more common in the smaller communities, primarily because local air service is not as attractive

to consumers as it might be from larger cities within driving distance. Local air fares and add-on amounts are also influencing factors.

Although leakage is more common in smaller cities, the following table (Table 5-3) shows that leakage occurs in a wide variety of markets across the country.

TABLE 5-3: ***Air Passenger "Leakage"***

Airport	Enplanements	Retention Rate
GRI(Grand Island, NE)	15,744	12%
GON (Groton-New London, CT)	16,190	3%
BRL (Burlington, IA)	18,996	21%
RHI (Rhinelander, WI)	35,700	41%
CAE (Columbia, SC)	117,000	78%
CMI (Champaign, IL)	125,134	49%
AVP (Wilkes Barre-Scranton, PA)	212,063	62%
AVL (Asheville, NC)	283,146	60%
SAV (Savannah, GA	635,209	74%

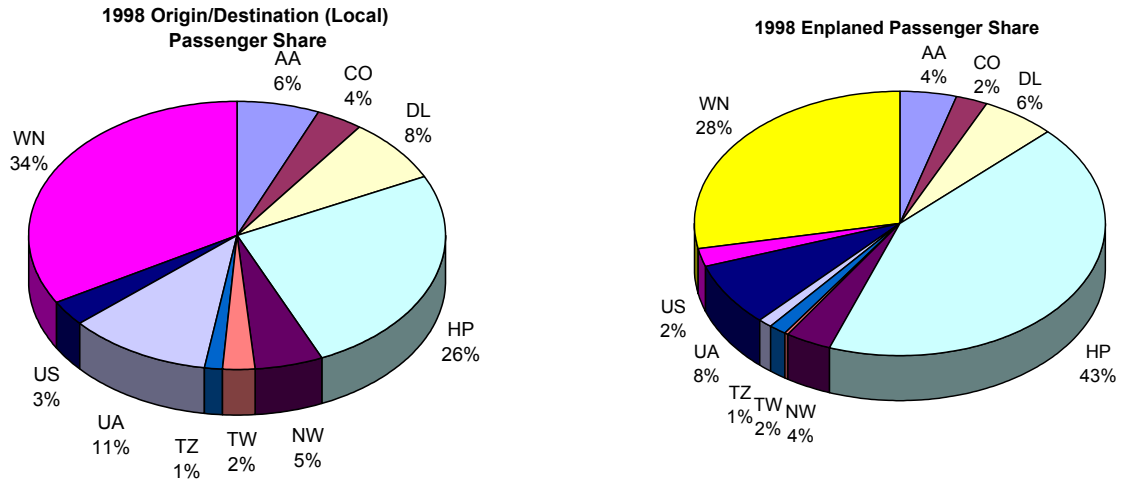
Source: Kiehl-Hendrickson Group - 2001

The "Phoenix Factor"

In addition to leakage between such cities as Kingman-Bullhead or Page-Flagstaff, major hub operations such as Phoenix tend to act as a regional magnet and draw passengers who drive from outlying regions of the state. Again, Arizona is not unique in this regard, as many other states witness similar patterns. Denver, Minneapolis, Detroit, Chicago, St. Louis, and Seattle each serve as air service anchors that offer hundreds of flights and nonstop destinations for both local consumers and passengers who choose to drive from the surrounding areas.

Phoenix, and to a much lesser extent Tucson, offer the additional uniqueness of being host to a very large presence of low-fare airline operations. Low fares, combined with high frequency, a multitude of destinations, and good jet service provide a very strong incentive for passengers. Exhibit 5-2 highlights the situation at Phoenix Sky Harbor.

EXHIBIT 5-2: ***Phoenix-Sky Harbor Passenger Share***



Source: Kiehl-Hendrickson Group - 2001.

Airline Aircraft Issues

In the 20 years since deregulation, "commuter airlines" have grown up to become Regional Airlines. These carriers once operated small propeller aircraft, and gradually upgraded their fleets to larger and larger equipment. Today, some have completely abandoned 19-seat aircraft entirely, opting for advanced turboprops with 30-37 seats. With the advancements in technology, regional jets of 35-70 seats have emerged as having viable operating and cost performance, and these jets are coming into the market at a rapid pace.

The good news about regional jets is that small jets are coming into the market. Over 600 of these jets have been ordered by U.S. carriers within the last three years, at values of over $12 billion. As the manufacturers fight to keep up with demand, airlines are taking delivery as fast as possible.

However, at prices of $15-$20 million PER aircraft, these jets are not generally being allocated to small markets as turboprop upgrades. In fact, as the regional airlines retire the small turboprops, smaller communities are witnessing either stagnation or actual declines in service. Although Mesa Airlines remains one of the few regionals focused on a 19-seat operation, it is unclear whether the overall trend toward larger aircraft will also impact Arizona's communities.

Table 5-4 illustrates the approximate economics of operating 19-seat aircraft, along with estimates of upgrading to larger mid-30 seat turboprops.

TABLE 5-4: ***Estimated Aircraft Economics***

	19 Seats	34 Seats
Trip Mileage	200	200
Available Seat Mile (ASM)	3,800	6,800
Trip Cost	$1,000	$1,400
Cost/ASM (cents	.26	.21
Cost/Seat	$ 53	$ 41
Annual Cost (3 daily round trips)	**$2.0 mil**	**$2.8 mil**

Source: Kiehl-Hendrickson Group - 2001

While the operating economics of the smallest commercial jets are not yet clear, it is true that airlines are allocating these jet aircraft to markets that can support the service. Beyond smaller, relatively remote communities that are not within reasonable drive distances of major airline hubs, the list quickly moves to cities of 200,000 or more, suggesting that only markets such as Flagstaff and Yuma will emerge as future candidates, even when used jets are available in the future. Table 5-5 identifies some additional markets nationwide that are currently served by regional jets.

TABLE 5-5: ***Small Markets Served by Regional Jets***

City	Population (000)	City	Population (000)
Helena, MT	53	Evansville, IN	290
Butte, MT	54	Boise, ID	377
Casper, WY	65	Appleton, WI	342
Missoula, MT	90	Des Moines, IA	429
Pasco, WA	93	Chattanooga, TN	448
Billings, MT	126	Kalamazoo, MI	450
Cedar Rapids, IA	182	Columbia, SC	493

Source: Kiehl-Hendrickson – Group - 2001

Several aircraft assumptions have been made to address the 20-year forecast period. Aircraft of 19 seats are assumed to remain in the fleet of airlines such as Mesa/America West Express to serve small communities. This assumption is consistent with Regional Airline Association (RAA) projections, which note that while 19-seaters will diminish in relative numbers, there will still be a role for such aircraft. It is also assumed that regional airlines will operate and expand their 30-37 seat turboprop fleets throughout the forecast period. Finally, with nearly 700 regional jets having already been ordered by U.S. carriers within the last two years and approximately the same number on option, it is anticipated that operations of these jets will continue to expand rapidly over the next decades. These aircraft will be more widely dispersed, to include regional commerce centers such as Flagstaff and Yuma.

The Role of Proactive Business Efforts

Cities all over the world have long fought to land new businesses of every kind. Aggressive economic development is a common way of life, and hardly a day goes by that the news does not contain information about efforts being made to bring in new business or industry.

The one common thread to these stories centers around the economic impact that will result. New jobs, increased taxes, multiplier spending, and all of the rest of the items on the list are cited as reasons for heavy recruitment efforts. Only in the last several years did communities begin, on a wide-spread basis, to recognize this same economic impact that is associated with airline service.

There appears to be three primary categories of benefits pertaining to additional air service:

1. Airport-specific benefits (airline revenues, concessions spending, funding and debt impact)
2. Competitive balance benefits (multiple suppliers, increased choices, less concentration)
3. Impact to the community (jobs, business expansion, visitor access, tourism impact, community recognition)

As a result of this increased acknowledgement and recognition of economic impact, there is increased competition between communities for scarce airline assets. Therefore, business leaders and airport officials are taking proactive actions to retain or expand commercial air service into their cities. The following examples show what some communities have outlined as challenges, and what types of actions they have taken.

TABLE 5-6: ***Air Service Challenges and Solutions***

CHALLENGES	
City	**Objective**
Mobile, Alabama	Compete with Pensacola, Panama City, & Gulfport/Biloxi
Waterloo, Iowa	Upgrade Northwest service to jets
Amarillo, Texas	Keep American jet service connections via DFW
Jackson, Mississippi	Attract ValuJet; compete with multiple cities
Newport News, Virginia	Attract additional service; compete with Norfolk & Richmond
Columbia, South Carolina	Become the base of operations for Air South
Vail, Colorado	Attract winter (and summer) visitors
St. Louis, Missouri	Support TWA during period of weakness
Sioux City, Iowa	Upgrade Northwest service to jets
Las Vegas and Reno, Nevada	Increase air service and visitor levels
SOLUTIONS	
City	**Plan**
Mobile, Alabama	Incentive package & private sector funding to attract new carrier
Waterloo, Iowa	Established Cedar Valley Jet Set program as a community support mechanism
Amarillo, Texas	Established Economic Development Corp; guaranteed payments
Jackson, Mississippi	Guaranteed funds; long-term advertising support
Newport News, Virginia	Industrial Development Authority made investment commitment
Columbia, South Carolina	City & State invested in airline start-up and operating headquarters
Vail, Colorado	Guaranteed financial support through Vail Associates group
St. Louis, Missouri	Established "Civic Progress" committee; pre-purchased tickets
Sioux City, Iowa	Provided advertising support; reduced and/or waived airline fees
Las Vegas and Reno, Nevada	Supported launch of new airline

Source: Kiehl-Hendrickson Group – 2001

In the end, the ability to attract and retain service in Arizona's communities could very well be influenced by local efforts linked to economic development. Such efforts have been shown to make a difference. For purposes of forecasting, an assumption must be made that reasonable support will exist; not record-setting subsidy contracts to bring in airline service, but not total complacency with respect to airline service opportunities. Consumers must recognize the value of access to local airline service, and recognize the challenges of attracting and retaining those services.

Service Level Build-Up Assumptions

Traditional top-down forecasting approaches provide one means of examining long-term expectations for passenger volumes and airline operations. However, extrapolation of trends or sole reliance on macro factors can produce an unrealistic picture that does not provide adequate guidance and direction for planning.

Ultimately, every airport's future passenger levels are linked to the specific airline services being provided. An estimate of 50,000 enplanements or 5,000 commercial aircraft operations doesn't have any value to the planning process unless those numbers can be meaningfully tied to realistic airline operations with real aircraft options that are matched to the size of the market.

For example, a recent evaluation of mid-west markets concluded that regardless of historical trends, the combination of geography, distance to airline hubs, availability of aircraft, and airline fleet decisions created a fairly narrow range of forecasts. For this reason, long-term projections for Arizona's communities are being examined from an airline planning perspective, given reasonable assumptions with respect to the shape of the industry over the next 20 years.

5.3 INTERNATIONAL GATEWAYS: Phoenix

Only Phoenix Sky Harbor fits the category of International Gateway:

Category	City	Characteristics	Outlook/Forecast Factors
International Gateway	Phoenix	- Major Hub Operations - International Service - Draws drive traffic from smaller communities	- Facility Constraints - Bilateral Agreements - Airline Maturity - Local vs. Connecting Traffic - MSA Growth- (Pick scenario consistent with matching factors)

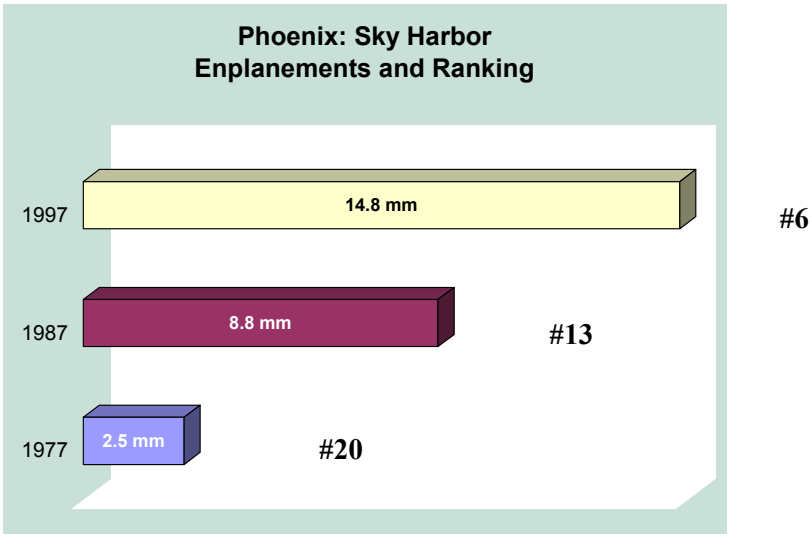
Source: Kiehl-Hendrickson Group - 2001

Buoyed by the rapid pace of sun belt growth and a mix of major employers that includes such corporations as Motorola, Intel, Allied Signal, and American Express, the Valley of the Sun continues its fast rate of expansion. Without question, the Greater Phoenix metro area has emerged as a leading commerce center for the southwest and for the nation as a whole.

From the airport perspective, Phoenix witnessed explosive increases in passengers and air service levels that outpaced the industry in the 20 years following deregulation in 1978. After Hughes AirWest merged with Republic Airlines, the newly-formed America West launched service from its headquarters in Phoenix. As the years went by, rapidly-growing Southwest Airlines also created a substantial franchise in the Valley, making Phoenix home to one of the strongest concentrations of low fare service in the U.S.

Exhibit 5-3 highlights a 20-year snapshot of Sky Harbor's enplanements. Most noteworthy is not only the traffic growth, but the relative ranking that has moved from the 20th largest airport in the nation to number 6 by 1997.

EXHIBIT 5-3: ***Sky Harbor Enplanements and Ranking***



Source: Kiehl-Hendrickson Group - 2001

In addition, traffic to and from Phoenix is widely distributed geographically, supporting nonstop airline services to virtually all domestic business centers and airline hubs. Part of the explosive traffic growth has resulted from the build-up of services in recent years to such markets as Washington, D.C., New York, and Florida destinations.

TABLE 5-7: ***Phoenix – Area Passenger Traffic, 1998***

	Annual Origin & Destination
Short-Haul, West Coast	5,398,910
Western Region	3,512,960
Mid-Continent	3,297,090
Upper Midwest/Ohio Valley	4,075,970
East Coast/Florida	3,452,210

Source: Kiehl-Hendrickson Group - 198

Reflecting on the factors that will influence Sky Harbor's traffic and service outlook over the next 20 years, the baseline forecast previously established by the Maricopa Association of Governments (MAG) creates a well-researched foundation. The MAG year-to-year growth rates appear consistent with expectations and market conditions.

Existing forecasts do appear to acknowledge the long-term opportunities and challenges of major airports in general and for this specific situation. The following additional factors will ultimately influence Sky Harbor's commercial service activities.

Headquarters and Base of America West Airlines

America West is categorized as a U.S. major airline, with annual revenues of nearly $2 billion and a fleet of approximately 110 jet aircraft. With headquarters in Tempe, America West is not only one of the predominant carriers at Sky Harbor, but a major employer in the Valley.

Current trends in the airline industry point to more and more consolidation, alliances, and potential mergers. America West has enjoyed years of success as an independent carrier, but alliances with Continental or others have been widely discussed. Within the last year, a potential acquisition of America West by United Airlines was widely publicized. Although no transaction resulted, America West's presence could be a key factor that impacts the Phoenix projections. Assumptions must be made at this time that America West will continue to operate on its current course, with no substantial change in direction or geographic focus away from the Phoenix market.

Southwest Airlines

Although Dallas is headquarters for Southwest, the over $4 billion airline holds a presence in Phoenix equal to America West. Both of these airlines have launched new routes, and Southwest clearly remains in a pattern of growth that at least doubles the rest of the major airlines.

Both airlines have already reached very strong levels of service to and from Phoenix, and rates of expansion will likely slow in the years ahead simply due to the fact that most of the major volume markets have already seen the introduction of service by one or both of these carriers.

Land, Facilities, and Growth Constraints

Clearly, Phoenix Sky Harbor has experienced growth that other major airports may never achieve. However, many factors are conspiring to constrain the airport from similar runaway growth in the future. Among the issues examined by local newspapers or other sources are the following:

- Sky Harbor now ranks third worst in the nation in departure delays caused by airport conditions, led only by Newark and LaGuardia. Delays were said to have more than doubled in 1998, up 121% and faster than any other U.S. city.
- Urban air pollution delayed more flights at Sky Harbor in 1998 than did weather in "soggy Seattle" or "smoggy Pittsburgh."
- Parking continues to be a factor, creating more pressures for off-site options.
- Noise also is a growing issue, with residents of Tempe (to the east of Sky Harbor) increasingly voicing complaints and concerns.
- The third parallel runway, a $176 million project that includes relocation of Air National Guard and aircraft hangars, will relieve some of the current pressures and absorb some level of future increases in aircraft operations. Congestion from general and corporate aviation continues to be a challenge.
- Plans for a fourth runway have been grounded. Allied Signal, Arizona's third largest employer, would be required to relocate from the airport location that it has operated for almost 50 years, and other suitable locations apparently do not exist on airport property.

Having now reached a position as the fifth-busiest airport in the nation based on number of flights, Sky Harbor will have to find creative ways to address its challenges if it is to accommodate continued high-growth expansion. Already, 24th Street is being scheduled for realignment to make room for runway extensions, 12 new gates are being added at Terminal 4 for America West, and work is under way on aprons, parking, and runway projects. In the final outlook, Sky Harbor's ability to deal with its constraints has put it in charge of its own ability to reach projections.

Emergence of Williams Gateway Airport

Williams Gateway is located southeast of Sky Harbor, and has completed the transition from the former Williams Air Force Base to a commercial operation with oversight from the cities of Mesa, Queen Creek, Gilbert, and the Gila River Indian Community. Gateway's advantages include an active Reuse Plan, three runways (10,400, 10,200, and 9,300 feet), and more than 4,000 total acres with sites offering apron access.

Officials from Williams Gateway have met with Sky Harbor leaders, and openly discussed future options and opportunities. Over the life of the 20-year forecast period, Williams Gateway Airport will no doubt emerge as a commercial service alternative to complement Sky Harbor. Many other large metropolitan areas already successfully support more than one commercial service airport, including Chicago, Dallas-Ft. Worth, and Houston, as well as the Los Angeles area, Bay Area, Washington area, etc.

While no formal air service forecast is included for Williams Gateway, this new commercial airport could, at the very least, witness the development of major cargo, corporate, and general aviation activities that allow Sky Harbor to absorb more long-term passenger growth.

International Service

The growth in global commerce has paved the way for an expanding list of open skies agreements between the U.S. and other nations. Even where true open sky agreements are not in place, bilateral agreements are allowing an increasing number of gateway cities to obtain international services.

Sky Harbor, for its part, has seen the introduction of nonstop service to London, and Phoenix's role as Arizona's premier international gateway should provide for additional opportunities in the future. Service to Mexico and Canada have certainly witnessed expansion, and it is likely only a matter of time before service to Asia will emerge to support high-tech industry and international business and leisure demand.

Scottsdale Airport

As the City of Scottsdale has grown, so has the airport. With origins as a military training airstrip, Scottsdale Municipal Airport has emerged as home to one of the Valley's main employment hubs, the Scottsdale Airpark. Proximity to the airport has made the 2,600 acres a very attractive business development center, where about 20,000 people are now employed.

Primarily serving general and corporate aviation, Sunrise Airlines has recently been operating a 19-seat Beechcraft between Scottsdale and the Grand Canyon. Whether this operation suggests that Scottsdale will attract commercial airline services in the future remains in question. Clearly, residents of the Scottsdale area and those reaching the northern and eastern growth areas are closer to Scottsdale than Sky Harbor.

However, low fares, jet aircraft, and high frequencies still make Sky Harbor the airport of choice for most of the Valley, and Scottsdale's relative inability to support larger operations will likely limit its venture into commercial service. In any event, future commercial flights at Scottsdale will not impact Sky Harbor's outlook, challenges, or planning process. What is more likely is that general aviation and corporate aviation that uses Phoenix - Sky Harbor today will gradually shift to the other Valley airports, including Scottsdale.

Valley of the Sun: Population and Growth Comments

The Valley's growth has often far exceeded expectations, and metro area expansion is projected to continue. Although the Arizona DES forecasts are for individual cities, a metro composite was built using Phoenix, Scottsdale, Tempe, Mesa, and other surrounding communities. Since suburbs often grow at faster rates than core cities, the MSA as a whole is projected to expand at a slightly faster rate than just Phoenix proper.

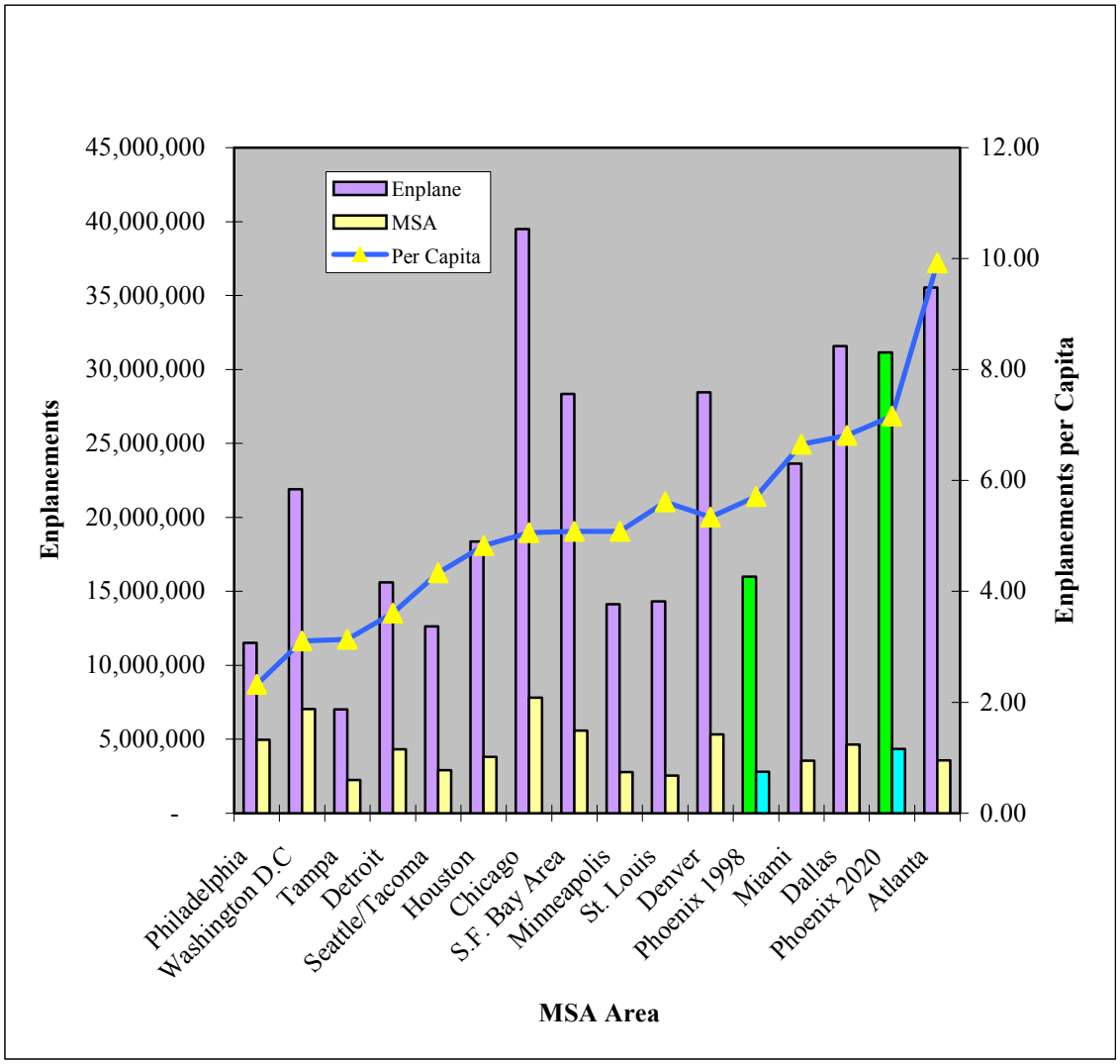
Using these metro area projections, the Valley is expected to reach a population of approximately 4.4 million by the year 2020. Applying passenger growth rates from the SANS95/MAG forecasts, enplanements would reach a level exceeding 31 million during the same period of time.

To put these passenger forecasts in perspective, the 31 million would represent over seven times the area's metro population, up significantly from the current level of 5.71 times population. As a test of reasonableness, Exhibit 5-4 shows current large metropolitan areas, many of which are currently the approximate size that the Valley is projected to become by 2020.

1998 enplanements are also shown on Exhibit 5-4, as are the enplanements per capita. Washington-Baltimore, Tampa-St. Petersburg, Detroit, Seattle-Tacoma, and Philadelphia all produce less than 4.0 annual enplanements per capita. The San Francisco Bay Area, Houston, Chicago, Minneapolis-St. Paul, and St. Louis are in the range of approximate 5 passengers per capita. Finally, Miami-Ft. Lauderdale, Denver, Dallas, and Atlanta (the busiest airport in the U.S.) all witness higher per capita figures. In fact, Atlanta's massive Delta Airlines hub helps that airport achieve nearly 10 passengers per capita. As the old saying once noted, "all flights lead to Atlanta."

To summarize, the Phoenix metro projections are certainly robust, particularly when compared to other large cities. The 2020 per capita projections for Sky Harbor would rank 3rd on this list of 16 major metropolitan areas, falling behind only Atlanta and Denver. Given that both America West and Southwest have already developed large franchises from Phoenix – Sky Harbor, it may be that growth rates diminish significantly since so many markets have already seen the introduction of high levels of service. Today, for example, over 90 daily departures (in each direction) exist between Phoenix and the Los Angeles basin. Critical mass has already been established, and high projections are dependent on an increasing propensity to travel among consumers, combined with the solving of facility and operating constraints by Sky Harbor itself over the forecast period.

EXHIBIT 5-4: ***MSA Comparison***



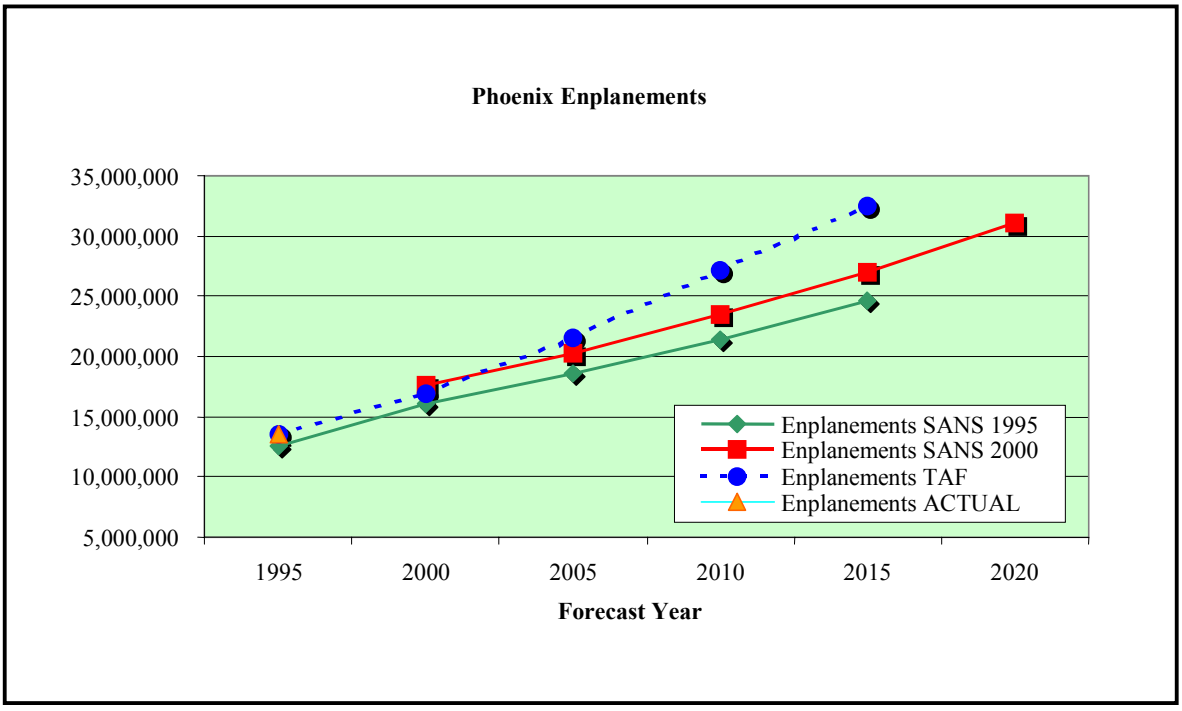
Source: Kiehl-Hendrickson Group - 2001

EXHIBIT 5-5: *Phoenix Potential Service Levels*

	1998	1999	2000	2005	2010	2015	2020
Projected City Population*:	1,238,120	1,263,895	1,289,125	1,419,813	1,544,093	1,671,489	1,795,539
		2.1%	2.0%	1.9%	1.7%	1.6%	1.4%
MSA:	2,798,800	2,860,533	2,931,970	3,285,860	3,739,371	4,057,209	4,348,248
		2.2%	2.5%	2.3%	2.6%	1.6%	1.4%
SANS95/MAG Enpl Fcst:	na	na	16,114,055	18,572,040	21,407,040	24,674,798	na
			5.1%	2.9%	2.9%	2.9%	
SANS 2000 Enpl Fcst:	15,984,620	16,793,442	17,643,630	20,334,932	23,439,034	27,016,974	31,141,082
		5.1%	5.1%	2.9%	2.9%	2.9%	2.9%
Enplanements per Capita:	5.71	5.87	6.02	6.19	6.27	6.66	7.16
SANS95/MAG Ops Fcst:	na	na	352,188	413,762	439,191	461,594	na
			3.3%	3.3%	1.2%	1.0%	
SANS 2000 Ops Fcst:	452,234	458,045	473,046	552,070	583,109	615,894	650,521
		1.3%	3.3%	3.3%	1.2%	1.0%	1.0%

1. Year to year percent changes are shown. For five year increments, the rate shown is a compound annual growth rate.

2. 1998 enplanements and operations data provided by the Arizona Department of Transportation.



Source: Kiehl-Hendrickson Group – 2001

- MAJOR METROPOLITAN CITIES: Tucson

Following the discussion of Phoenix, Tucson remains as the only other major metro area in the state:

Category	City	Characteristics	Outlook/Forecast Factors
Major Metropolitan	Tucson	- Strong Domestic Traffic - Multiple Carriers - Multiple Hub Services - Some Point to Point Services - Not Feeder Dependant	- Some Facility Issues - Proximity to Competition (Possible strong growth) - Airline Maturity - New Route Opportunities

Source: Kiehl-Hendrickson Group – 2001

Categorized in this market assessment as a major metropolitan area, Tucson is not a true airline hub but, nevertheless, has a substantial number of commercial services. Anchored by several of Arizona's top employers, Tucson has followed a growth path similar to the greater Phoenix area, albeit on a smaller population and employment scale. The Pima Association of Government (PAG) analysis has also been used as a cross-check with SANS95 data, already recognizing the many factors that will keep Tucson at the forefront of commercial service growth as a non-airline hub airport serving a wide region of Arizona.

Tucson's Business Rankings – Arizona's Top Employers

Ranking	Company	Description
9	Raytheon Missile Systems	Tactical Missile Manufacturer
24	Carondelet Health Network	Hospitals
35	TMC Healthcare	Hospital
40	BHP Cooper Inc.	Copper Mining and Refining
42	ASARCO Inc.	Copper Mining
69	American Airlines	Airline
77	Bombardier Aviation Services	Aircraft Manufacturing & Service
92	Burr-Brown Corp	Integrated Circuits Manufacturer
93	First Data Teleservices	Telecommunication Center
98	Unisource Energy Corp	Electric Utility

Source: Kiehl-Hendrickson Group - 2001

Going forward, Tucson has witnessed the initial foray into what some have called the next multibillion-dollar industry, already gaining 80 optics-related companies. With the University of Arizona providing the foundation for one of the world's hottest business sectors, the city is primed to become a center for optical sciences and the rapid business expansion associated with new technologies.

Assuming that the Tucson metro area continues to grow over the foreseeable future, the current population of nearly 775,000 should easily reach one million and higher. Cities within this population range today are shown in Table 5-8, along with their 1998 enplanements. Note that these cities are not airline hubs, and, therefore, their enplanements are not reflecting high numbers of connecting/transit passengers. Clearly, the markets that enjoy low fare airline service, including Nashville, Austin, and Jacksonville, have witnessed a much greater level of passenger activities, and Tucson's growth will likely see more low fare services in its future.

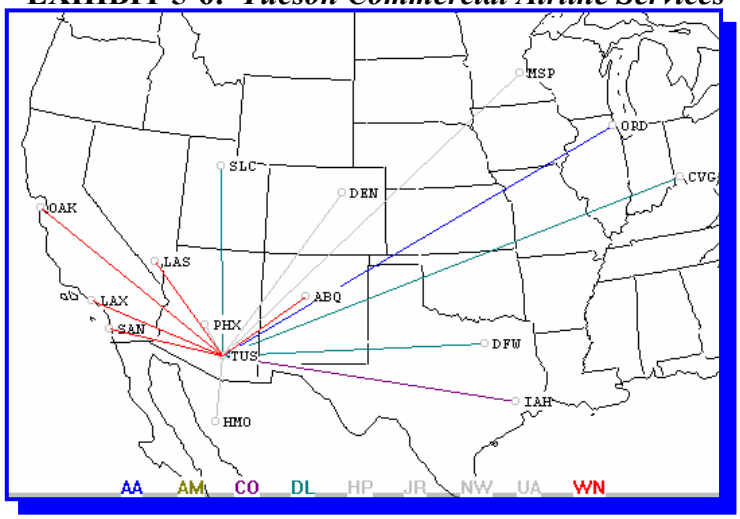
TABLE 5-8: ***Example Enplanements/Major Metro Areas***

	MSA	1998 Enplanements	Enplanements Per Capita
Greensboro	1,148,700	1,274,000	1.11
Nashville	1,128,400	3,907,000	3.46
Hartford	1,112,600	2,753,000	2.47
Austin	1,044,600	3,042,000	2.91
Oklahoma City	1,030,000	1,727,000	1.68
Jacksonville	1,025,600	2,304,000	2.25
Grand Rapids	1,021,200	896,000	0.88
West Palm Beach	1,001,100	2,931,000	2.93
Louisville	995,400	1,842,000	1.85
Dayton	949,600	1,088,000	1.15
Richmond	937,400	1,261,000	1.35
Providence	905,600	2,271,000	2.51
Total	**12,300,200**	**25,296,000**	**2.06**
TUCSON	**774,200**	**1,743,000**	**2.25**

Source: Kiehl-Hendrickson Group - 2001

Finally, Tucson's current commercial airline services, shown in Exhibit 5-6, highlight a core that is strong and growing. Tucson's level of service, shown in Exhibit 5-7, will continue to influence the southern part of Arizona, serving as a primary air service alternative for the southeastern and south-central communities that cannot generate the critical mass to attract their own services.

EXHIBIT 5-6: ***Tucson Commercial Airline Services***



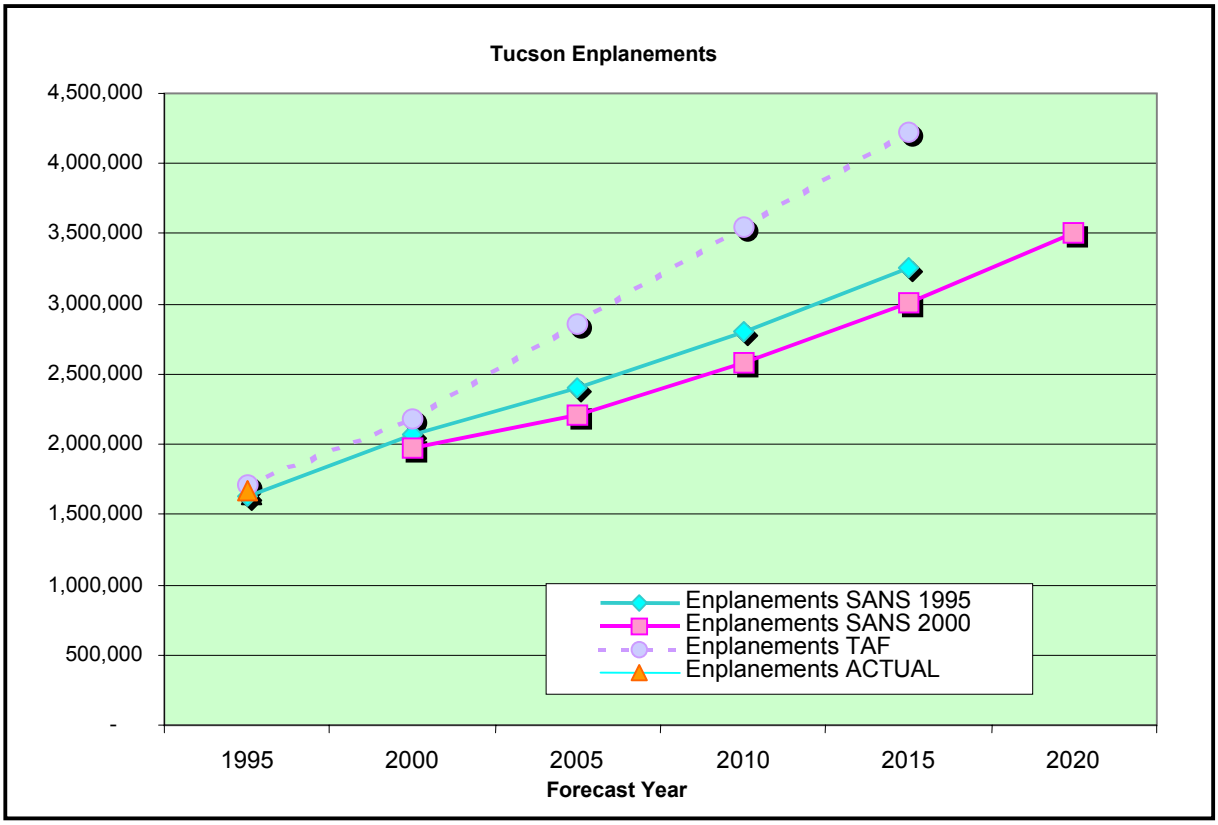
Source: Kiehl-Hendrickson Group - 2001

EXHIBIT 5-7: *Tucson Potential Service Levels*

	1998	1999	2000	2005	2010	2015	2020
Projected City Population*:	461,001	467,455	474,467	510,108	540,307	565,736	589,899
		1.4%	1.5%	1.4%	1.2%	0.9%	0.8%
MSA:	774,200	785,039	796,815	856,669	907,386	950,091	990,670
		1.4%	1.5%	1.4%	1.2%	0.9%	0.8%
SANS 1995 Enpl Fcst:	na	na	2,075,000	2,400,000	2,797,282	3,260,328	na
			5.0%	3.0%	3.1%	3.1%	
SANS 2000 Enpl Fcst:	1,735,118	1,822,516	1,914,328	2,214,162	2,580,682	3,007,872	3,505,778
		5.0%	5.0%	3.0%	3.1%	3.1%	3.1%
Enplanements per Capita:	2.24	2.32	2.40	2.58	2.84	3.17	3.54
SANS 1995 Fcst Ops:	na	na	51,578	65,828	76,313	88,898	na
			2.0%	5.0%	3.0%	3.1%	
SANS 2000 Fcst Ops:	46,696	47,630	48,583	62,005	71,881	83,735	97,544
		2.0%	2.0%	5.0%	3.0%	3.1%	3.1%

1. Year to year percent changes are shown. For five year increments, the rate shown is the compound annual growth rate.

2. 1998 enplanements and operations data provided by the Arizona Department of Transportation.



Source: Kiehl-Hendrickson Group - 2001

5.5 REGIONAL COMMERCE CENTERS: Flagstaff, Yuma

Flagstaff and Yuma are the two Arizona cities that best fit the Regional Commerce Center category:

Category	City	Characteristics	Outlook/Forecast Factors
Regional Commerce Centers	Flagstaff Yuma	- Possible Single Hub Today - Prop & Jet Mix Likely - Multiple Hubs in Future	- Geography - Fleet Decisions - Leakage Trends - Corporate Activity - "Tag" Operations (Guarantee of future service - More "upside" than "downside")

Source: Kiehl-Hendrickson Group – 2001

These characteristics suggest that Flagstaff and Yuma face commercial air service opportunities over the long-term outlook, with greater growth options than many smaller communities due to their economic role within the state.

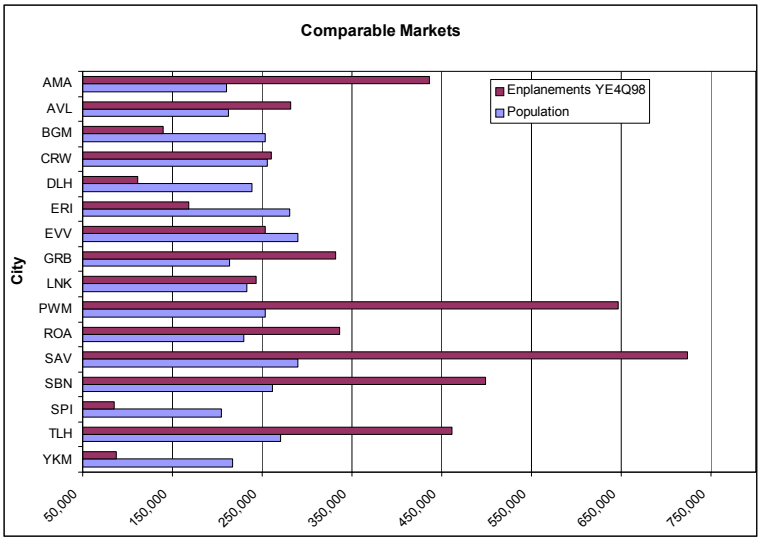
Population and Growth

Flagstaff and Yuma, with similar area populations of approximately 125,000, are not unlike many similarly-sized communities in the U.S. If they experienced approximately 3.5% annual growth over the next 20 years, these cities would double their populations.

Over time, some cities will flourish, while others will stagnate, and it is difficult to know how these two Arizona communities will engage growth, economic development, and population expansion. However, Flagstaff and Yuma appear positioned to succeed, particularly as they reside in a sun belt state that has seen steady in-migration.

As a test of reasonableness, Exhibit 5-8 shows the level of passenger enplanements being experienced today in communities that have populations of approximately 200,000 – 300,000 people (about the same size that Flagstaff and Yuma could be in the future).

EXHIBIT 5-8: ***Comparable Markets***



Source: Kiehl-Hendrickson Group – 2001

Leakage

A recent evaluation of these markets indicated that neither community retains anywhere near all of its passenger traffic. Yuma lost approximately one half of its passengers, while Flagstaff saw an even greater share drive to other airports (primarily Phoenix). With relatively low levels of commercial air service currently being provided, these leakage results are not uncommon. However, as Flagstaff and Yuma emerge as even stronger regional commerce centers over the next two decades, its is expected that service levels will improve and that leakage rates could decline significantly.

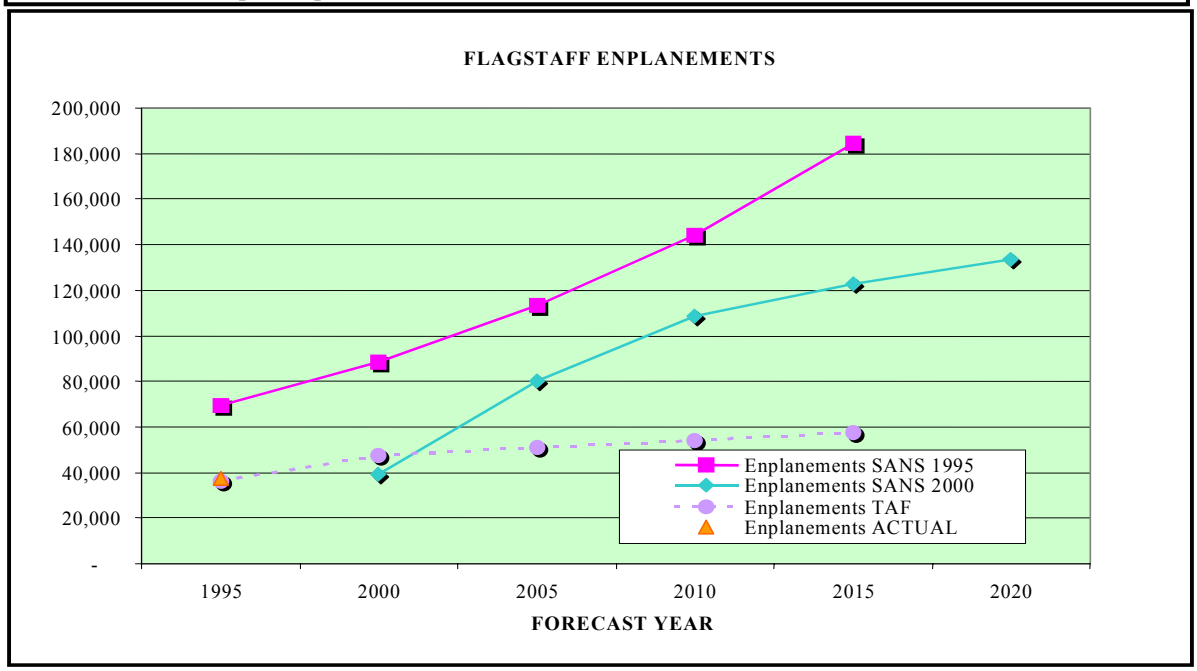
Reported Leakage Rates

Yuma	51%
Flagstaff	69%

Given their positions as regional centers and the increased future availability of small regional jet aircraft, both Flagstaff and Yuma are expected see the addition of services from airline hubs. Neither community will probably ever retain all of their passengers, largely due to the presence of Southwest Airlines in surrounding markets that include Phoenix, Tucson, and San Diego. However, these small jets will begin entering the market at an increasing rate over the next few years, bringing trip costs down and making such hubs as Salt Lake City and Denver much more viable than they are today.

EXHIBIT 5-9: *Flagstaff Potential Service Levels*

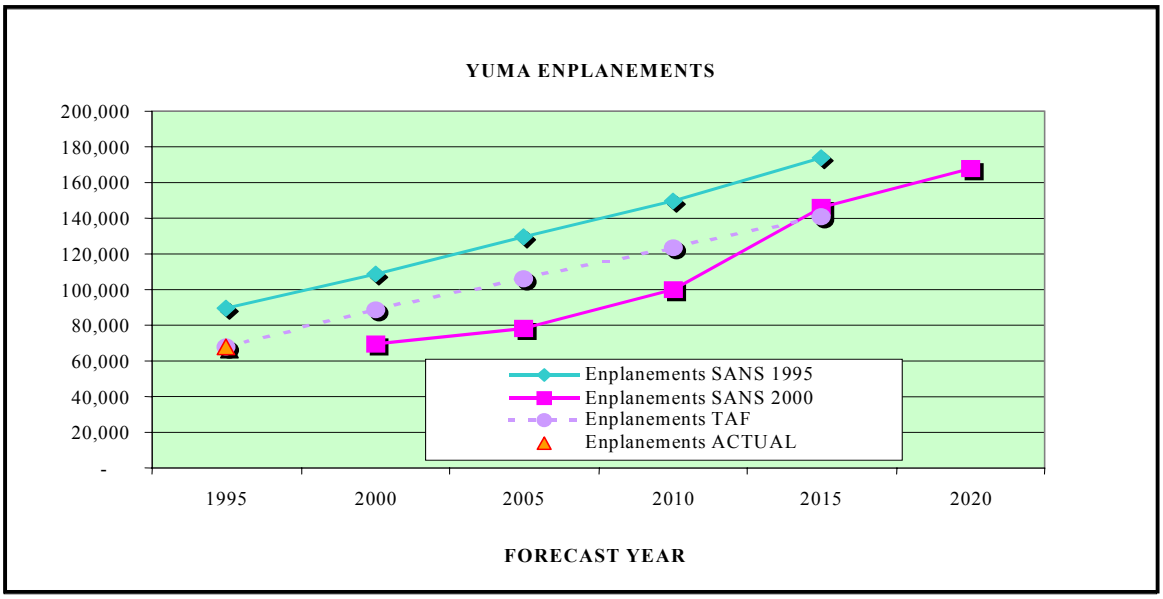
	Today	2005	2010	2015	2020
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	**PHX**
Daily Departures:	7	7	7	7	7
Seat per Departure:	37	37	37	37	37
Projected Load Factor:	46%	42%	44%	46%	48%
Passenger per Departure:	17	16	16	17	18
Destination:		**LAX**	**LAX**	**LAX**	**LAX**
Daily Departures:		3	3	4	4
Seat per Departure:		50	50	50	50
Projected Load Factor:		45%	50%	45%	50%
Passenger per Departure:		23	25	23	25
Destination:		**SLC**	**SLC**	**SLC**	**SLC**
Daily Departures:		3	3	4	4
Seat per Departure:		50	50	50	50
Projected Load Factor:		45%	50%	45%	50%
Passenger per Departure:		23	25	23	25
Destination:			**DEN**	**DEN**	**DEN**
Daily Departures:			3	3	3
Seat per Departure:			50	50	50
Projected Load Factor:			45%	50%	55%
Passenger per Departure:			23	25	28
Total Daily Passengers:	119	244	331	374	407
Total Daily Operations:	7	13	16	18	18
Days of Operation per Year:	365	365	365	365	365
Projected Completion Rate:	90%	90%	90%	90%	90%
Projected Annual Departures:	2,300	4,271	5,256	5,913	5,913
Projected Annual Operations:	4,599	8,541	10,512	11,826	11,826
Projected Annual Enplanements:	**39,137**	**80,082**	**108,885**	**122,905**	**133,640**
Population/MSA:	125,000	143,044	154,333	165,380	175,755
Per Capita Enplanements:	**0.31**	**0.56**	**0.71**	**0.74**	**0.76**



Source: Kiehl-Hendrickson Group - 2001

EXHIBIT 5-10: *Yuma Potential Service Levels*

	Today	2005	2010	2015	2020
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	
Daily Departures:	6	7	5	5	
Seat per Departure:	19	19	19	19	
Projected Load Factor:	53%	55%	55%	55%	
Passenger per Departure:	10	10	10	10	
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	**PHX**
Daily Departures:	2	3	4	4	8
Seat per Departure:	37	37	37	37	37
Projected Load Factor:	60%	60%	60%	60%	65%
Passenger per Departure:	22	22	22	22	24
Destination:	**LAX**	**LAX**	**LAX**	**LAX**	**LAX**
Daily Departures:	6	3	3	4	4
Seat per Departure:	30	50	50	50	50
Projected Load Factor:	60%	65%	65%	65%	65%
Passenger per Departure:	18	33	33	33	33
Destination:			**LAS**	**LAS**	**LAS**
Daily Departures:			2	3	3
Seat per Departure:			50	50	50
Projected Load Factor:			65%	65%	70%
Passenger per Departure:			33	33	35
Destination:				**DFW**	**DFW**
Daily Departures:				3	3
Seat per Departure:				50	50
Projected Load Factor:				50%	55%
Passenger per Departure:				25	28
Total Daily Passengers:	213	237	304	444	510
Total Daily Operations:	14	13	14	19	18
Days of Operation per Year:	365	365	365	365	365
Projected Completion Rate:	90%	90%	90%	90%	90%
Projected Annual Departures:	4,599	4,271	4,599	6,242	5,913
Projected Annual Operations:	9,198	8,541	9,198	12,483	11,826
Projected Annual Enplanements:	**69,911**	**77,937**	**99,716**	**145,706**	**167,502**
Population/MSA:	131,300	148,732	164,285	181,218	199,418
Per Capita Enplanements:	**0.53**	**0.52**	**0.61**	**0.80**	**0.84**



Source: Kiehl-Hendrickson Group - 2001

5.6 SMALL COMMUNITIES: Show Low, Lake Havasu City, Prescott, Sierra Vista, Kingman, Safford, Winslow, Page

Arizona's smaller communities have experienced various rates of growth over the years, reflecting their role in state tourism or development of business and commerce. The following table highlights these communities side by side with one another:

Category	City	Characteristics	Outlook/Forecast Factors
Small and Rural Community	Show Low Lake Havasu Prescott Sierra Vista Kingman Safford Winslow Page	- Regional Service Only - "Tag" Service to Single hub - Some EAS contracts - Seasonal Markets - Tag Dependent - Often Single-Hub Only	- Vulnerable to Carrier Fleet decisions - Excessive Leakage - Carrier Reliability/Completion Factor - Alternative Transportation Modes - Proximity to Alternative Air Service - Small Mass Overshadows Strong - Business travel/high yield traffic (Results could hinge on efforts of Community leadership)

Source: Kiehl-Hendrickson Group - 2001

Population Size and Concentration

The cities in this category will continue to see growth over the long term of the forecast period, but none are expected to reach the critical mass that suggests they will serve as regional commerce centers. As a matter of fact, three of these communities (Prescott, Kingman, and Page) have been identified as Essential Air Service (EAS) cities, given federal funding to help ensure some level of commercial air service. Typically, EAS applies only to the smallest air service markets that could otherwise lose all of their air service.

Leakage

The growth of ground shuttle services has been a nation-wide trend, with operators seizing on opportunities to transport passengers from outlying communities into major airports where service levels, and often air fares, are significantly better. Comfortable 9-15 passenger vans are often used, with multiple daily trips running on a regularly scheduled basis.

Reported Leakage Rates

Page	63%
Lake Havasu	74%
Bull Head City	76%
Sierra Vista	78%
Prescott	79%
Kingman	79%
Show Low	86%

Source: AZ DOT

For trips within 100-200 miles, the convenience, reliability, and cost of ground transport alternatives have proven attractive to consumers in many smaller cities. Even though markets such as Prescott have continued to experience steady growth, improvements such as the widening for Route 69 to Interstate 17 have made the drive alternative more attractive.

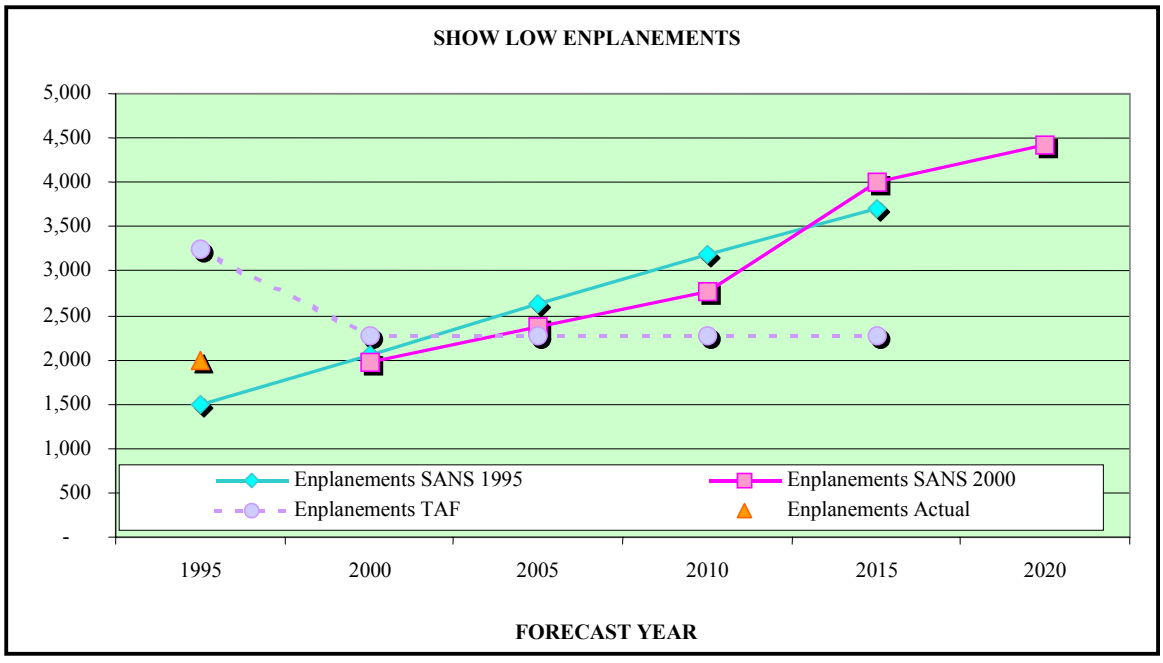
Leakage will continue to be a major factor in these communities. As shown earlier (Table 5-3), even much larger markets such as Champaign, IL, Wilkes-Barre, PA, and Asheville, NC lose 40-50% of their passengers today.

Furthermore, commercial airline service options for these communities are not projected to be nearly as robust as Flagstaff and Yuma will witness. Service upgrades are expected over the time span of the forecast period, but consumer preference for larger jets and lower air fares will continue to generate relatively high leakage rates.

EXHIBIT 5-11: *Show Low Potential Service Levels*

	Today	2005	2010	2015	2020
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	**PHX**
Daily Departures:	3	3	3	4	4
Seat per Departure:	8	8	8	8	8
Projected Load Factor:	25%	30%	35%	38%	42%
Passenger per Departure:	2	2	3	3	3
Total Daily Passengers:	6	7	8	12	13
Total Daily Operations:	3	3	3	4	4
Days of Operation per Year:	365	365	365	365	365
Projected Completion Rate:	90%	90%	90%	90%	90%
Projected Annual Departures:	986	986	986	1,314	1,314
Projected Annual Operations:	1,971	1,971	1,971	2,628	2,628
Projected Annual Enplanements:	**1,971**	**2,365**	**2,759**	**3,995**	**4,415**
Population:	7,542	8,390	8,823	9,257	9,742
Per Capita Enplanements:	**0.26**	**0.28**	**0.31**	**0.43**	**0.45**

1. A community of this size will very likely be able to support only the smallest of commercial aircraft. Nonstops to hubs other than Phoenix are not within the scope of this forecast.



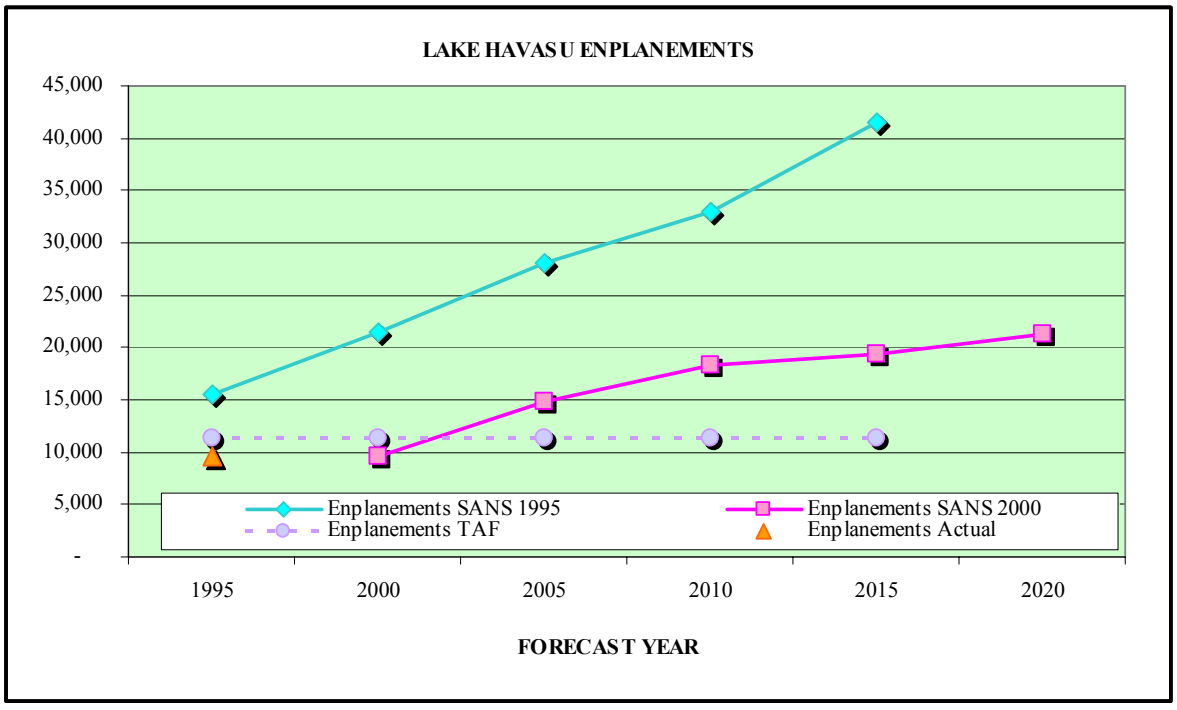
Source: Kiehl-Hendrickson Group - 2001

EXHIBIT 5-12: *Lake Havasu Potential Service Levels*

	Today	2005	2010	2015	2020
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	**PHX**
Daily Departures:	4	6	6	7	7
Seat per Departure:	19	19	19	19	19
Projected Load Factor:	49%	50%	55%	50%	55%
Passenger per Departure:	9	10	10	10	10
Total Daily Passengers:	37	57	63	67	73
Total Daily Operations:	4	6	6	7	7
Days of Operation per Year:	365	365	365	365	365
Projected Completion Rate:	71%	71%	80%	80%	80%
Projected Annual Departures:	1,037	1,555	1,752	2,044	2,044
Projected Annual Operations:	2,073	3,110	3,504	4,088	4,088
Projected Annual Enplanements:	**9,651**	**14,772**	**18,308**	**19,418**	**21,360**
Population:	41,362	53,275	58,777	63,783	68,886
Per Capita Enplanements:	**0.23**	**0.28**	**0.31**	**0.30**	**0.31**

1. Low fares and yields associated with leisure and retirement travel will create hurdles for service to Los Angeles or other hubs within the region.

2. Frequency to PHX, however, is expected to increase throughout the forecast period.



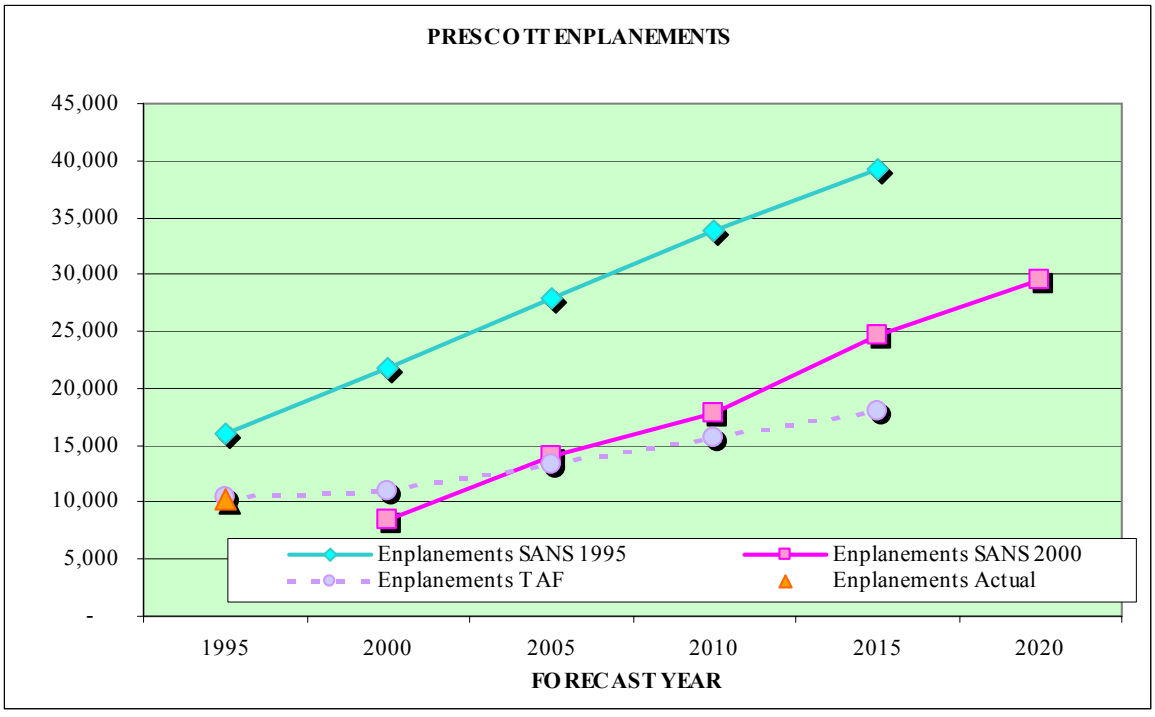
Source: Kiehl-Hendrickson Group - 2001

EXHIBIT 5-13: *Prescott Potential Service Levels*

	Today	2005	2010	2015	2020
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	**PHX**
Daily Departures:	3	5	4	5	6
Seat per Departure:	19	19	30	30	30
Projected (ENPL) Load Factor:	45%	45%	45%	50%	50%
Passenger per Departure:	9	9	14	15	15
Total Daily Passengers:	26	43	54	75	90
Total Daily Operations:	3	5	4	5	6
Days of Operation per Year:	365	365	365	365	365
Projected Completion Rate:	90%	90%	90%	90%	90%
Projected Annual Departures:	986	1,643	1,314	1,643	1,971
Projected Annual Operations:	1,971	3,285	2,628	3,285	3,942
Projected Annual Enplanements:	**8,426**	**14,043**	**17,739**	**24,638**	**29,565**
Population:	53,424	67,293	78,048	87,117	96,228
Per Capita Enplanements:	**0.16**	**0.21**	**0.23**	**0.28**	**0.31**

1. Low fares and yields associated with leisure and retirement travel will create hurdles for service to other hubs within the region.

2. Local population, despite good drive access to PHX, will still warrant aircraft frequency and capacity upgrades.



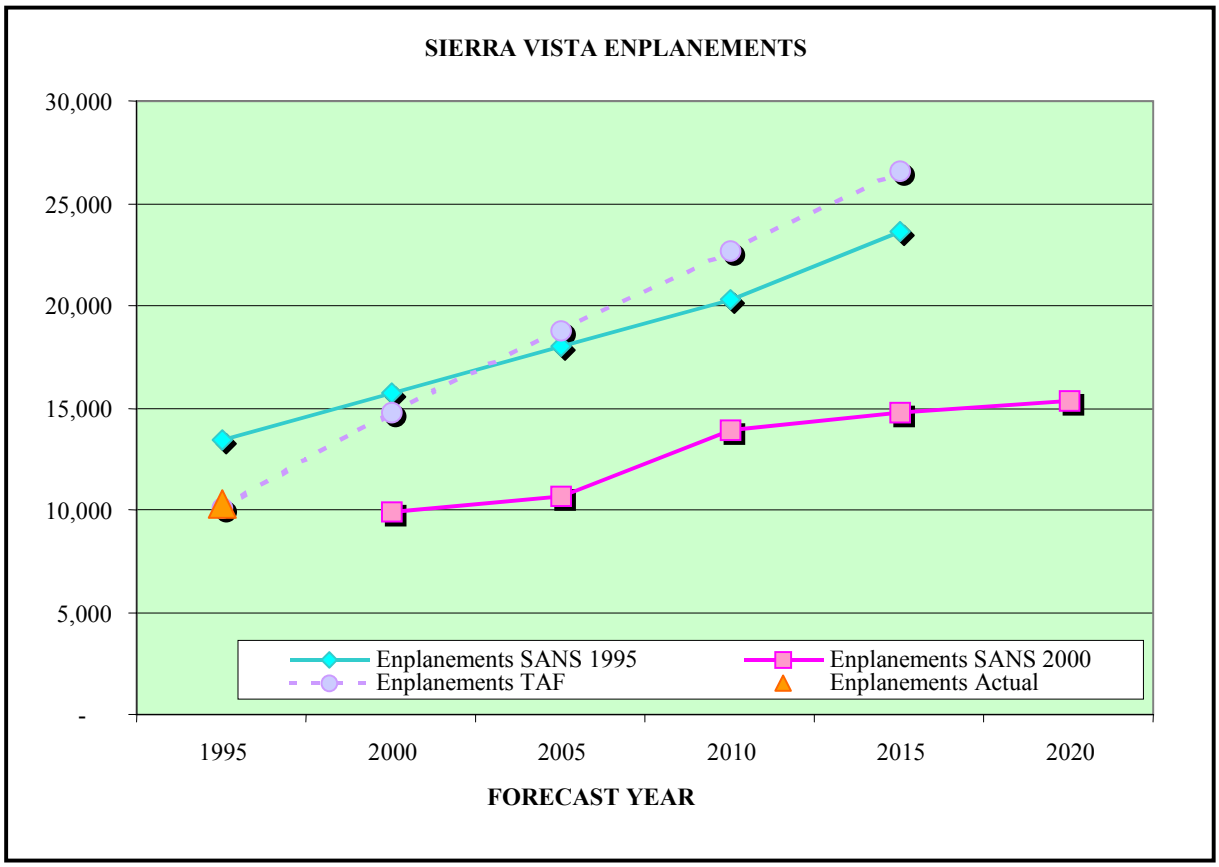
Source: Kiehl-Hendrickson Group - 2001

EXHIBIT 5-14: *Sierra Vista Potential Service Levels*

	Today	2005	2010	2015	2020
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	**PHX**
Daily Departures:	3	3	3	3	3
Seat per Departure:	19	19	30	30	30
Projected Load Factor:	53%	57%	47%	50%	52%
Passenger per Departure:	10	11	14	15	16
Total Daily Passengers:	30	32	42	45	47
Total Daily Operations:	3	3	3	3	3
Days of Operation per Year:	365	365	365	365	365
Projected Completion Rate:	90%	90%	90%	90%	90%
Projected Annual Departures:	986	986	986	986	986
Projected Annual Operations:	1,971	1,971	1,971	1,971	1,971
Projected Annual Enplanements:	**9,924**	**10,673**	**13,896**	**14,783**	**15,374**
Population:	39,428	43,402	46,642	49,795	52,571
Per Capita Enplanements:	**0.25**	**0.25**	**0.30**	**0.30**	**0.29**

1. Passenger leakage to Tucson will continue to be a challenge that prohibits service to additional hubs within the region.

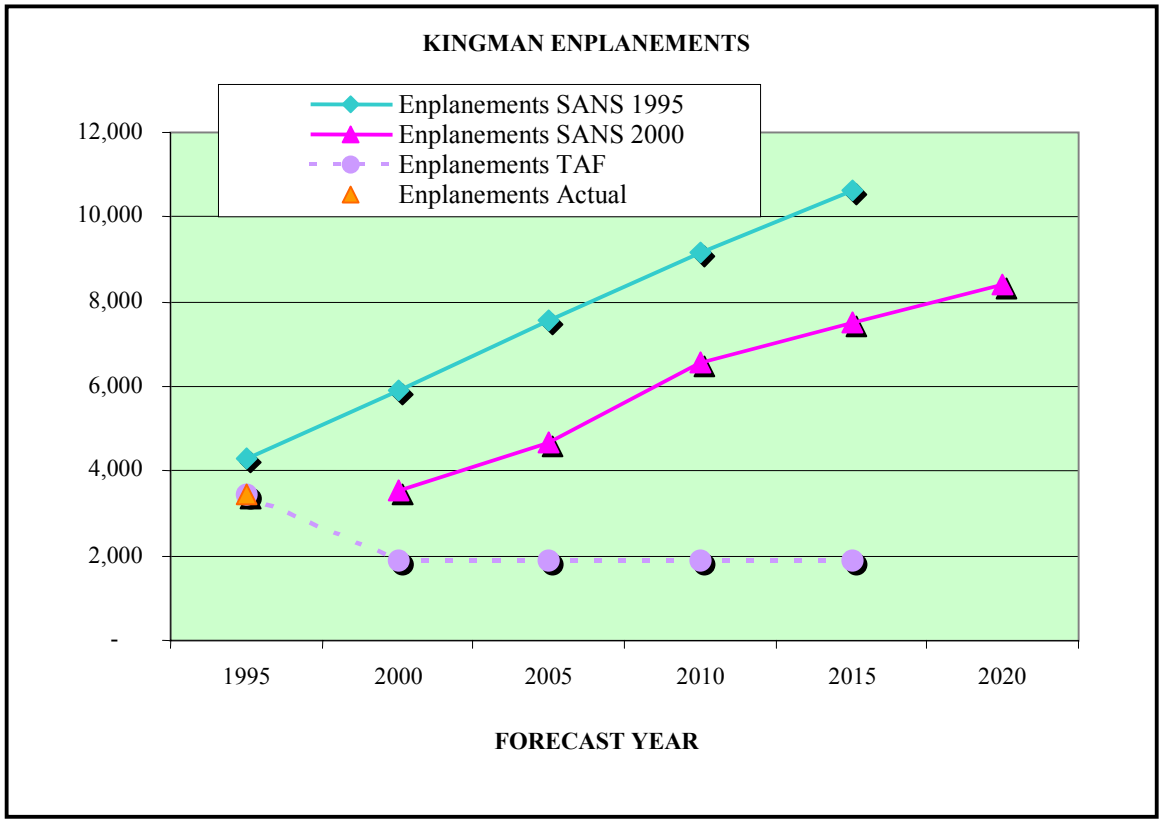
2. While frequency remains modest, increased military traffic could support capacity upgrades within the forecast period.



Source: Kiehl-Hendrickson Group - 2001

EXHIBIT 5-15: *Kingman Potential Service Levels*

	Today	2005	2010	2015	2020
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	**PHX**
Daily Departures:	3	3	3	3	3
Seat per Departure:	19	19	19	19	19
Projected Load Factor:	19%	25%	35%	40%	45%
Passenger per Departure:	4	5	7	8	9
Total Daily Passengers:	11	14	20	23	26
Total Daily Operations:	3	3	3	3	3
Days of Operation per Year:	365	365	365	365	365
Projected Completion Rate:	90%	90%	90%	90%	90%
Projected Annual Departures:	986	986	986	986	986
Projected Annual Operations:	1,971	1,971	1,971	1,971	1,971
Projected Annual Enplanements:	**3,558**	**4,681**	**6,554**	**7,490**	**8,426**
Population:	18,724	23,073	25,225	27,256	29,227
Per Capita Enplanements:	**0.19**	**0.20**	**0.26**	**0.27**	**0.29**

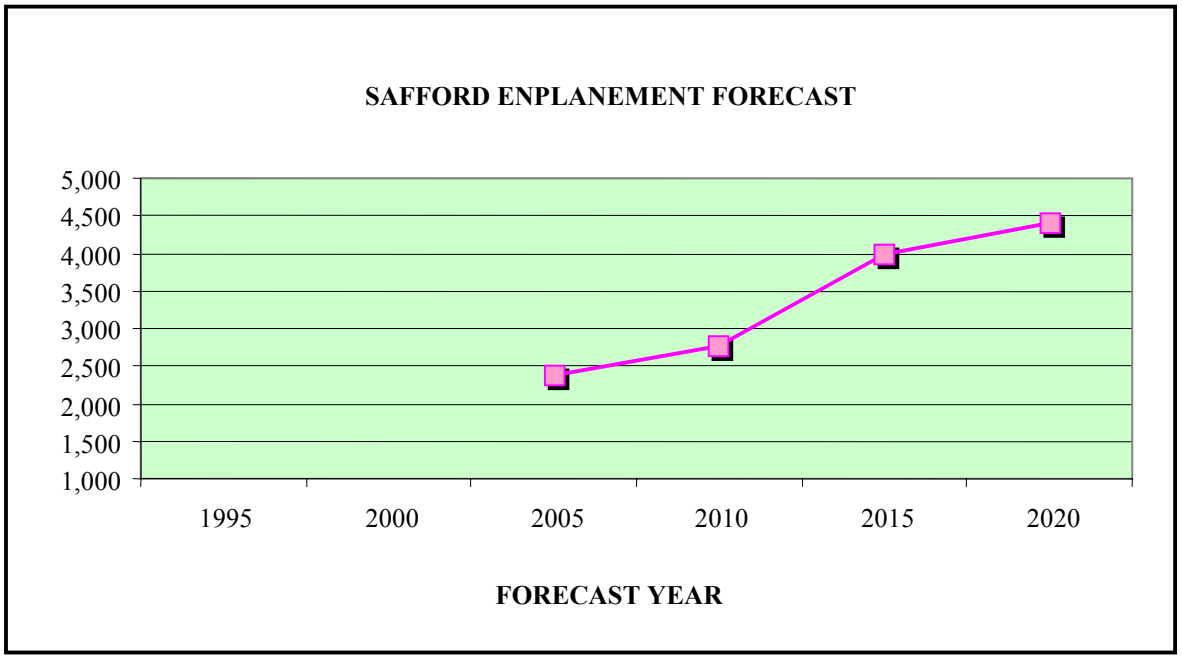


Source: Kiehl-Hendrickson Group - 2001

EXHIBIT 5-16: ***Safford Potential Service Levels***

	Today	2005	2010	2015	2020
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	**PHX**
Daily Departures:		3	3	4	4
Seat per Departure:		8	8	8	8
Projected Load Factor:		30%	35%	38%	42%
Passenger per Departure:	0	2	3	3	3
Total Daily Passengers:	0	7	8	12	13
Total Daily Operations:	0	3	3	4	4
Days of Operation per Year:		365	365	365	365
Projected CompLetion Rate:		90%	90%	90%	90%
Projected Annual Departures:	-	986	986	1,314	1,314
Projected Annual Operations:	-	1,971	1,971	2,628	2,628
Projected Annual Enplanements:	**-**	**2,365**	**2,759**	**3,995**	**4,415**
Population:	10,304	11,837	12,969	13,473	10,304
Per Capita Enplanements:	**-**	**0.20**	**0.21**	**0.30**	**0.43**

1. With continued growth of the community, it can be forecast that some entry-level commercial service could be realized. Significant levels of community support would be paramount to the long-term success of any such service.

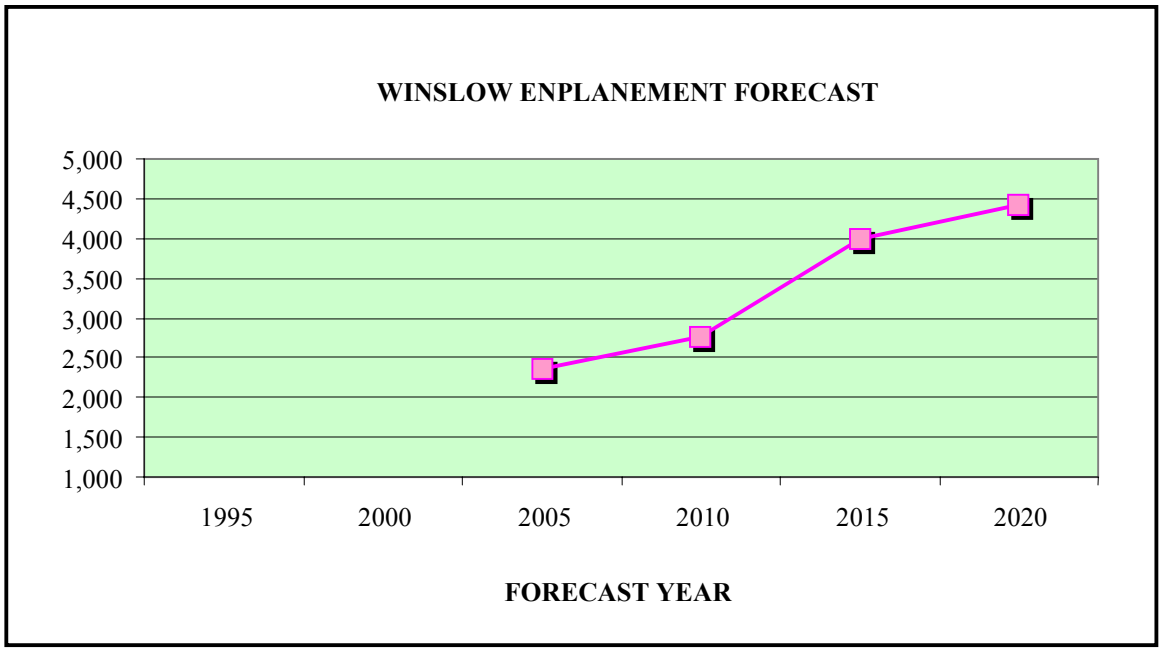


Source: Kiehl-Hendrickson Group - 2001

EXHIBIT 5-17: ***Winslow Potential Service Levels***

	Today	2005	2010	2015	2020
Destination:	**PHX**	**PHX**	**PHX**	**PHX**	**PHX**
Daily Departures:		3	3	4	4
Seat per Departure:		8	8	8	8
Projected Load Factor:		30%	35%	38%	42%
Passenger per Departure:	0	2	3	3	3
Total Daily Passengers:	0	7	8	12	13
Total Daily Operations:	0	3	3	4	4
Days of Operation per Year:		365	365	365	365
Projected Completion Rate:		90%	90%	90%	90%
Projected Annual Departures:	-	986	986	1,314	1,314
Projected Annual Operations:	-	1,971	1,971	2,628	2,628
Projected Annual Enplanements:	**-**	**2,365**	**2,759**	**3,995**	**4,415**
Population:	11,220	11,842	12,249	12,601	13,007
Per Capita Enplanements:	**-**	**0.20**	**0.23**	**0.32**	**0.34**

1. With continued growth of the community, it can be forecast that some entry level commercial service could be realized. Significant levels of community support would be paramount to the long term success of any such service.



Source: Kiehl-Hendrickson Group - 2001

5.7 DESTINATION MARKETS: Grand Canyon, Bullhead City/Laughlin, Page

Category	City	Characteristics	Outlook/Forecast Factors
Destination Markets	Grand Canyon Bullhead City Page (EAS)	- Traffic and/or Service: - Not related to population - Primarily "in-bound" - Group Travel - Short Stays - Low Fares/Yield - Seasonal Influences	- Challenges to attracting scheduled service - Periodic Charters - Tour Packaging - Hotel Accommodations

Source: Kiehl-Hendrickson Group - 2001

Destination markets are unique among all others, with no reliable relation between local city size or population and the commercial service activities that take place. In many respects, the Grand Canyon and Laughlin-Bullhead City are not unlike Las Vegas, Orlando, or Buffalo-Niagara Falls. All experience large volumes of in-bound passenger traffic that is disproportionately higher than out-bound passenger levels, and all have higher mixes of international and group traffic than most other markets.

The Grand Canyon remains one of the world's foremost tourism destinations, and there is no reason to assume that this will change over the next 20 years. Due to environmental and traffic congestion concerns, Canyon officials are making plans for such substantial improvements as light rail systems to accommodate the growing visitor volumes. Commercial air service will continue to be a mix of scheduled flights and low-frequency charter activities, even if overfly rules are changed or other restrictions are placed on sightseeing excursions. The forecast for the Grand Canyon reflects continued growth, supported by ongoing demand for this natural attraction.

Bullhead City grew up around the building of the Davis Dam, but has since been the gateway to Laughlin's casino properties. The airport in Bullhead City once enjoyed low-frequency scheduled service provided by Morris Air from Salt Lake City, Oakland, and San Jose. Per-flight passenger revenues generally exceeded $5,000, over twice that of most PHX-Las Vegas flights, and onboard load factors over 80% were not uncommon.

Although Morris Air was subsequently acquired by Southwest Airlines, it is very conceivable that similar service could emerge again in future years. Laughlin now has a substantial gaming, recreation, and entertainment franchise, and the market offers an experience that remains unique relative to Las Vegas or other regional gaming alternatives. Charter services have done well, and the only inhibiting factor for future traffic and service growth will be the expansion rates of casino and hotel properties.

Finally, Page has been included in this category, primarily due to the traffic associated with Lake Powell and recreational activities. As shown in the accompanying tables, all three experience a wide variety of passenger numbers and projections, due to inconsistent reporting and confusion between scheduled service, charters, air taxi operations, etc. In fact, each of these markets could warrant its own more intensive analysis as necessary.

EXHIBIT 5-18: *Grand Canyon Potential Service Levels*

SOURCES	1993	1995	1998	1999	2000	2005	2010	2015	2020
SANS 1995 Enplanements:	377,819	927,000	na	na	1,152,000	1,322,398	1,518,000	1,742,535	
AZ DOT Enplanements:	na	na	512,365	na	na	na	na	na	
FAA Terminal Area Forecast Air Carrier & Commuter Enpl:	241,338	283,322	386,763*	418,422*	450,081*	608,376*	766,671*	924,966*	
US DOT*	355,726	285,092	273,149	na	na	na	na	na	na
SANS 2000 Projected Enplanements:			273,149	295,508	317,867	429,662	541,457	653,252	757,298
SANS 1995 Projected Operations:		124,379	na	na	235,000	282,800	311,903	344,000	
FAA Terminal Area Forecast Air Carrier & Commuter Ops:			185,064	188,341	191,912	213,930	235,099	252,214	
SANS 2000 Projected Operations:		na	131,395	133,015	135,537	151,087	166,037	179,072	205,933

- The very nature of the Grand Canyon facility will produce challenges to the ongoing need for accurate forecasting. Strong ties to the National and International economies and related tourism trends result in complex forecasting unrelated to linear growth of the local
- Future efforts of the United States Park Service, the FAA and environmental organizations to control traffic levels and preserve the integrity of the Park will play an extensive role in future air service
- The Grand Canyon is accompanied by a small community, itself, limited in growth due to efforts of maintaining park and environmental conditions. This community is strongly tied to the welfare of the park and is unlikely to jeopardize this resource with expansive commercial development.
- Air service campaigns by new entrant carriers such as Far West may provide advertising and public scheduled service alternatives for the Grand Canyon community. Aggressive local awareness of the service will be paramount to the success of any scheduled service without a major code share relationship.
- Air Taxi type operations will continue to support the bulk of the air travel to/from the Grand Canyon. Day trip travelers originating in Las Vegas, California and within the Park will remain as the major source of the Grand Canyon air travel. A comparatively small amount of air travel could be expected to be generated from a local population base.
- SANS 2000 enplanements utilize the FAA Terminal Area Forecast growth rates, applied to the most recent U.S DOT Figures (1998).
- Grand Canyon operations forecast utilizes the existing FAA Terminal Area Forecast, adjusted downward for passenger projections.

EXHIBIT 5-19: *Bullhead Potential Service Levels*

SOURCES	1993	1995	1998	1999	2000	2005	2010	2015	2020
SANS 1995 Enplanements:	146,500	112,000	na	na	235,000	403,000	617,000	874,000	
AZ DOT Enplanements:	na	na	30,387	na	na	na	na	na	na
FAA Terminal Area Forecast Air Carrier & Commuter Enpl		75,795*	56,786*	58,666*	60608*	71,327*	83,948*	98,805*	
US DOT*	91,297	82,896	26,592						
SANS 2000 Enplanement Projections:				32,000	40,000	65,000	80,000	95,000	110,000
FAA Terminal Area Forecast Air Carrier & Commuter Ops:	7,600	11,862	4,941*	5,000*	5,060*	5,379*	5,802*	6,378*	7,042*
SANS 2000 Projected Operations:				2,750	3,339	4,902	5,529	6,151	7,131

- Carriers such as Sun Country and ATA refocus their efforts towards increased scheduled service and less charter based operations.
- Growth of low fare carriers (WN,FL,F9, VG) would imply that services similar to those once offered by Morris Air could eventually return to Bullhead City.
- Bullhead City operations forecasts utilize the existing FAA Terminal Area Forecast, adjusted downward for passenger projections.

*Source: DOT Report T-100

EXHIBIT 5-20: *Page Potential Service Levels*

SOURCES	1993	1995	1998	1999	2000	2005	2010	2015	2020
SANS 1995 Enplanements	3,200	4,504	na	na	6,904	8,040	9,727	11,768	
AZ DOT Enplanements:	na	na	27,000	na	na	na	na	na	na
FAA Terminal Area Forecast Air Carrier & Commuter Enpl	13,112	19,704	12,296	12,955	13,613	16,904	20,196	23,487	na
US DOT*	11,567	19,411	11,164	na	na	na	na	na	na
SANS 2000 Enplanement Projection:				25,587	13,613	16,904	20,196	23,487	27,227
SANS 1995 Projected Ops:		1258	na	na	1636	2272	3154	4380	na
SANS 2000 Projected Ops:			16,451	16,967	17,457	19,566	21,563	23,803	26,280

- Page continues to establish itself as a strong in-bound "destination" market, primarily serving the seasonal travel demand for the Lake Powell area.
- As Flagstaff realizes the increased service levels associated with its expanding role as a Regional Commerce Center, Flagstaff could develop as a more reasonable alternative for travel to and from the Page / Lake Powell area.
- Due to several data descrepancies, the existing FAA Terminal Area Forecast appears to be a reasonable base for the SANS 2000 projections.

*Source: DOT Report T-100

TABLE 5-9: *Forecast Summary Of Commercial Enplanements And Operations 1995-2020*

		1995	2000	2005	2010	2015	2020
PHX Enplanements	*SANS 1995*	12,588,987	16,114,055	18,573,992	21,409,457	24,677,778	
	SANS 2000		17,643,630	20,334,932	23,439,034	27,016,974	31,141,082
	TAF	13,517,238	16,846,937	21,583,700	27,117,641	32,515,592	
	ACTUAL	13,502,744					
Operations	*SANS 1995*	330,450	352,188	413,762	439,191	461,594	
	SANS 2000		473,046	552,070	583,109	615,894	650,521
		1995	2000	2005	2010	2015	2020
TUS Enplanements	*SANS 1995*	1,622,930	2,075,000	2,400,000	2,797,276	3,260,314	
	SANS 2000		1,970,858	2,214,162	2,580,682	3,007,872	3,505,778
	ACTUAL	1,672,887					
Operations	*SANS 1995*	46,716	51,578	65,828	76,313	88,898	
	SANS 2000		48,583	62,005	71,881	83,735	97,544
		1995	2000	2005	2010	2015	2020
YUM Enplanements	*SANS 1995*	89,500	109,000	129,500	150,000	173,745	
	SANS 2000		69,911	77,937	99,716	145,706	167,502
	TAF	68,140	88,309	105,706	123,104	140,501	
	ACTUAL	67,822					
Operations	*SANS 1995*	17,482	16,800	19,700	21,200	22,600	
	SANS 2000		9,198	8,542	9,910	12,484	11,826
		1995	2000	2005	2010	2015	2020
FLG Enplanements	*SANS 1995*	69,500	88,700	113,300	144,500	184,292	
	SANS 2000		39,137	80,082	108,885	122,905	133,640
	ACTUAL	37,370					
	TAF	36,229	47,531	50,802	54,074	57,346	
Operations	*SANS 1995*	9,093	10,666	13,019	15,893	19,400	
	SANS 2000		4,600	8,542	10,512	11,826	11,826
		1995	2000	2005	2010	2015	2020
SOW Enplanements	*SANS 1995*	1,500	2,055	2,623	3,191	3,699	
	SANS 2000		1,971	2,365	2,759	3,995	4,415
	TAF	3,244	2,279	2,279	2,279	2,279	
	ACTUAL	2,000					
Operations	*SANS 1995*	2,000	2,880	4,000	5,000	6,000	
	SANS 2000		1,972	1,972	1,972	2,628	2,628
		1995	2000	2005	2010	2015	2020
HII Enplanements	*SANS 1995*	15,500	21,500	28,000	33,000	41,500	
	SANS 2000		9,651	14,772	18,308	19,418	21,360
	ACTUAL	9,633					
Operations	*SANS 1995*	3,017	7,600	8,800	10,200	11,000	
	SANS 2000		2,074	3,110	3,504	4,088	4,088
		1995	2000	2005	2010	2015	2020
PRC Enplanements	*SANS 1995*	15,935	21,833	27,865	33,902	39,302	
	SANS 2000		8,426	14,043	17,739	24,638	29,565
	ACTUAL	10,339					
Operations	*SANS 1995*	6,938	10,903	13,000	16,000	20,000	
	SANS 2000		1,972	3,286	2,628	3,286	3,942

Source: Kiehl-Hendrickson Group - 2001

TABLE 5-8: *Forecast Summary of Commercial Enplanements and Operations 1995-2020 (continued)*

		1995	2000	2005	2010	2015	2020
FHU Enplanements	*SANS 1995*	13,400	15,700	18,000	20,300	23,600	
	SANS 2000		9,924	10,673	13,896	14,783	15,374
	ACTUAL	10,286					
Operations	*SANS 1995*	5,600	6,200	6,900	7,500	8,200	
	SANS 2000		1,972	1,972	1,972	1,972	1,972
		1995	**2000**	**2005**	**2010**	**2015**	**2020**
IGM Enplanements	*SANS 1995*	4,311	5,907	7,539	9,172	10,633	
	SANS 2000		3,558	4,681	6,554	7,490	8,426
	ACTUAL	3,459					
Operations	*SANS 1995*	1,643	2,594	4,591	8,126	14,381	
	SANS 2000		1,972	1,972	1,972	1,972	1,972
		1995	**2000**	**2005**	**2010**	**2015**	**2020**
GCN Enplanements	*SANS 1995*	927,000	1,152,000	1,322,398	1,518,000	1,742,535	
	SANS 2000		317,867	429,662	541,457	653,252	757,298
	ACTUAL						
Operations	*SANS 1995*	124,379	235,000	282,800	311,903	344,000	
		1995	**2000**	**2005**	**2010**	**2015**	**2020**
IFP Enplanements	*SANS 1995*	112,000	235,000	403,000	617,000	874,000	
	SANS 2000		40,000	65,000	80,000	95,000	110,000
Operations	*SANS 1995*	14,433	11,790	18,800	26,000	32,480	
	SANS 2000		3,339	4,902	5,529	6,151	7,131
		1995	**2000**	**2005**	**2010**	**2015**	**2020**
PGA Enplanements	*SANS 1995*	4,505	6,904	8,040	9,727	11,768	
	SANS 2000		13,613	16,904	20,196	23,487	27,227
Operations	*SANS 1995*	1,258	1,636	2,272	3,154	4,380	
	SANS 2000		17,457	19,566	21,563	23,803	26,280
		1995	**2000**	**2005**	**2010**	**2015**	**2020**
INW Enplanements	*SANS 1995*						
	SANS 2000			2,365	2,759	3,995	4,415
Operations	*SANS 1995*						
	SANS 2000			1,971	1,971	2,628	2,628
		1995	**2000**	**2005**	**2010**	**2015**	**2020**
SAF Enplanements	*SANS 1995*						
	SANS 2000			2,365	2,759	3,995	4,415
Operations	*SANS 1995*						
	SANS 2000			1,971	1,971	2,628	2,628

Source: Kiehl-Hendrickson Group - 2001

TABLE 5-10: ***Population and Enplanements per Capita, 1998-2020***

TABLE 5-10: ***Population and Enplanements per Capita, 1998-2020 (continued)***

TABLE 5-10: ***Population and Enplanements per Capita, 1998-2020 (continued)***

TABLE 5-10: ***Population and Enplanements per Capita, 1998-2020 (continued)***

5.8 CARGO AND MAIL

Commercial Air Freight: Overview and Implications for Arizona

Commercial air freight is a rapidly growing segment of the aviation industry, and deserves the attention of planners on a nationwide basis. The FAS points out that although domestic and international air tonnage account for a minor portion of the total carried by all modes of transportation, the air shipment value is disproportionately higher. Domestic air represented 0.1% of the domestic tonnage in 1997 but 6% of the value, with international results of 0.9% and 36% respectively.

High technology industries drive much of the growth in air freight, primarily due to the value of goods produced and the immediacy of the manufacturing and assembly process. Just-in-time (JIT) processes have become commonplace on a global basis, further supporting the need for rapid transit of sub-assembly components. An examination of specific high tech commodities shows an overwhelming percentage that uses air freight as the mode of transportation.

Regarding the aircraft used to provide commercial air freight services, a number of all-cargo airlines as well as passenger carriers turn to freighter aircraft such as DC8's, DC10's, 737F's, and the largest 747 Freighters. However, available cargo capacity on passenger aircraft, referred to as belly space, often serves as the primary, if not only, cargo lift into many airports. Small parts, medical supplies, domestic and international mail, and other time-sensitive goods can most always be accommodated by excess space in passenger aircraft being operated to all but the largest markets.

Another key element of the air cargo transportation network is the vast trucking systems associated with freight companies. Unlike passenger travel, air cargo often goes via extremely out-of-the-way routings on its way to the final destination, and many advertised "air cargo" shipments into smaller and mid-sized communities are actually trucked from the nearest large metropolitan area.

The following exhibits highlight some of these factors in more detail. With the FAA forecasting air cargo demand to grow at annual rates that are about 1.0% higher than those projected for passenger demand, planners must be taking such growth into account. In Arizona's particular situation, however, the future is expected to look much like the current blend of air cargo activities, with the Valley of the Sun still being the primary recipient of true air cargo activity.

Phoenix Sky Harbor, servicing the greater Valley region, has clearly defined its role as the center of Arizona's commercial air cargo. The Phoenix Metro area has the attributes required for supporting long-term commercial air cargo expansion:

1. Population mass
2. Strong base of industry and commerce
3. Strength of high-tech companies that depend on air freight
4. Access to most of the State's outlying communities (for service via the roadway/ trucking networks)

As the Metro Area's population continues to move towards the East Valley, both integrators and heavy freight operators may seek to take advantage of Williams Gateway's emerging facilities, relative lack of congestion, and airport operating fees that could remain lower than Sky Harbor's. Whether the growth happens at Sky Harbor, Williams Gateway, or a longer-term combination of the two, the Phoenix Metro area will remain the hub of Arizona's commercial air cargo.

Tucson's emergence as a regional freight center, Yuma's position as another commerce hub, and the acceleration of trans-border trade, could also have positive long-term effects on cargo operations in the southern portion of Arizona, although all trends suggest that Phoenix's position as the hub will dwarf other cities. Looking at the broader picture, the majority of border operations shipments have continued to utilize trucking as the primary mode of transportation, with goods being driven to the larger metroplex operations for transfer to aircraft where necessary.

Finally, the "out-state" regions of Arizona are expected to remain dependent on a combination of belly freight capacity in passenger aircraft and access to and from their markets via the trucking networks of air freight carriers. With much less population mass, little high-tech industrial activity relative to the major markets, and a strong roadway system that facilitates trucking, Arizona's small and mid-sized communities shouldn't require airport infrastructure investments necessary to accommodate dedicated air freight activities.

Main Points – Industry

- "High tech" industries are far and away the biggest users of air freight services, in large part due to their heavy reliance on Just-In-Time inventory management processes.

- The goods in these types of industries are typically relatively expensive and the cost to carry this type of inventory could be prohibitively expensive. This creates demand for relatively inexpensive air freight.

- While the cost of air freight may be inexpensive relative to carrying inventory, companies pay a significant premium for the ability to ship time-definite goods in a very short amount of time (cost of overnight, time-definite services can be 40x the cost of using other modes of transportation).

- Its easy to understand why companies pay this aforementioned premium when one considers the cost of shutting down an assembly line (i.e. auto plant) because certain parts are not available.
  RELIABILITY is key.

- These trends have resulted in increased demand/market share for integrated carriers like Federal Express and UPS, who offer "door-to-door" service and control. Integrated carrier share increases first occurred in the domestic market and more recently is occurring in International markets.

- The aforementioned points speak to the high yield segment of the air freight business and the key industries that drive air freight profitability. Essentially, high tech-driven air freight is analogous to business travelers in the passenger-side of the airline business.

- In the passenger airline business, while business travel is the key segment, no airline could be profitable with this business segment alone. Likewise, the cargo business needs volume from the low yield portion of the market to be profitable. This segment of this industry is commonly referred to as "belly freight."

- Belly freight makes up about 50% of the air freight market for large, hub airports, but only about 20% at smaller airports.

- In other words, the larger the belly space capacity is, the more upside exists for dedicated air cargo service. More belly space = more scheduled passenger service = larger metropolitan areas.

- Implication: Significant cargo growth is only likely to occur in/near large metropolitan areas with a heavy emphasis on high tech industry.

- A recent industry trend has been the growth of secondary airports in/near large metropolitan areas where dedicated cargo facilities are available and less "gridlock" on the ground exists. Also, these airports still offer access to local industry and "belly space" at nearby larger passenger-served airports.

The State of Arizona: Cargo Future Overview

- Major metropolitan markets, like Phoenix, with heavy exposure to high technology companies should prosper with respect to air cargo demand.

- Phoenix air cargo growth could come from PHX or it could occur at Williams Gateway Airport (WGA). Carriers have been adding cargo capacity at secondary airports in/near major metropolitan areas (like WGA) over the past few years because they can not only offer many of the benefits of the passenger-served airports like PHX (access to high tech industry and cheap belly space) but the secondary airport also offers other unique advantages (dedicated cargo facilities, lack of ground "grid-lock").

- While a market like Tucson (TUS) benefits from belly space on scheduled passenger airlines and offers the potential for NAFTA-related growth, at the end of the day, it doesn't appear that TUS is large enough or has the right industry mix to generate significant amounts of air cargo growth.

- Other markets within Arizona do no appear large enough to support any type of significant air cargo growth.

5.8.1 DRIVERS OF COMMERICAL AIR CARGO

What are the Key Factors driving Air Freight Demand?

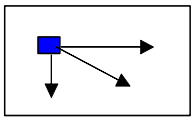
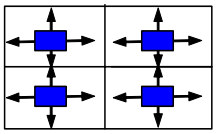
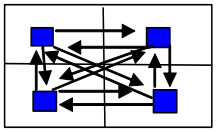
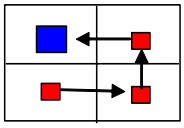
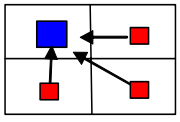
1. **Economy/Goods Component of GDP**

2. **Industry Location/Type**

3. **Just-In-Time (JIT) Inventory Practices**
4. **Globalization of Business**
5. **International Trade Agreements**
6. **Carrier-Shipper Alliances**
7. **Centralized Warehousing**
8. **Packaging Materials**

Mostly by types of industries that utilize: 1) In-Process (JIT) & 2) Sub-assembly Facilities

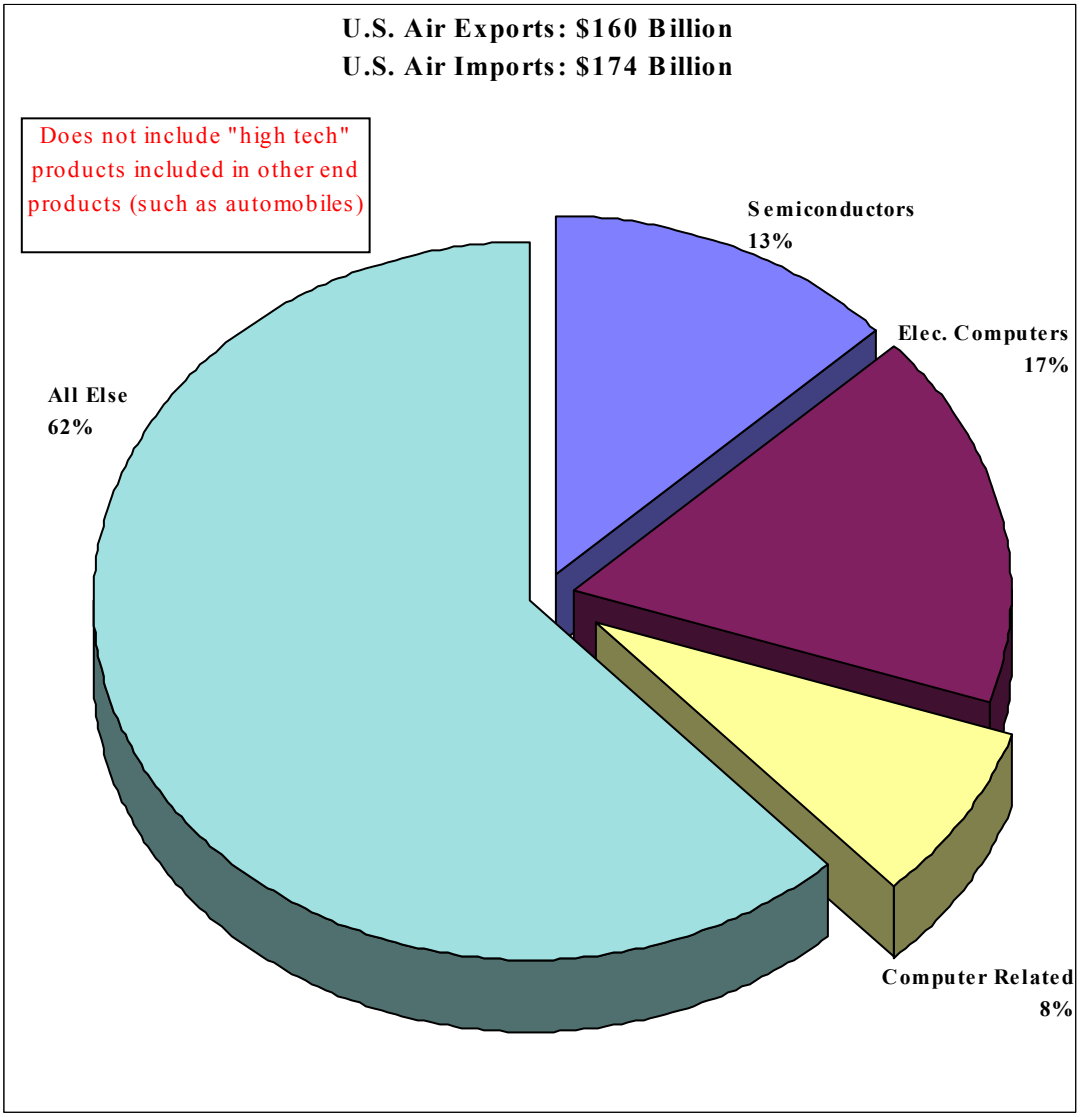
EXHIBIT 5-21: ***Industries that Utilize: 1) In-Process (J-I-T) & 2) Sub-assembly Facilities drive air freight***

	Supply Chain Configuration	Representative Industries	Plant Scale	Air Freight Impact
A		• Construction Equip • Oil Field Machinery • Medical Instruments • Industrial Pumps • Commercial Printing Presses	**Very Large** (One Location For Worldwide Production)	Inbound supply chain is typically limited to a particular geographic region Outbound distribution chains tend to be long distance
B		• Branded Consumer Products • Agricultural Products • Retail Distribution • Direct Mail Distribution	**Medium to Small** (Limited By National Market Size)	Generates large domestic flows. Unless topgraphy requires use of air, most volume goes by surface modes
C		• TV & Stereo Equip. • Office Copiers • Cellular Phones • Musical Equipment • Periodicals • CD/ROM Media	**Very Large** (Due to Regional Market Demand)	Regional market demand is satisfied with surface transportation. Unless topography requires use of air, most volume goes by surface modes
D		• Semiconductors • Printed Circuit Boards • Telecommunications Equip • Apparel	**Medium to Small** (In-Process Facilities) **Large** (Final Assembly)	J-I-T intensive configuration requires time-definite transportation. Industries with this type of chain generally are heavy users of air freight
E		• Computers and Peripherals • Automotive Assembly • Aircraft Engines • Satelite Equipment	**Large to Small** (Subassembly Facilities) **Large** (Final Assembly)	Requires tight control of transport logistics. Air freight is used to ensure that delayed surface shipments do not cause production line stoppages

*Source: MGI - 2001

"High Tech" industries generate most air freight demand …

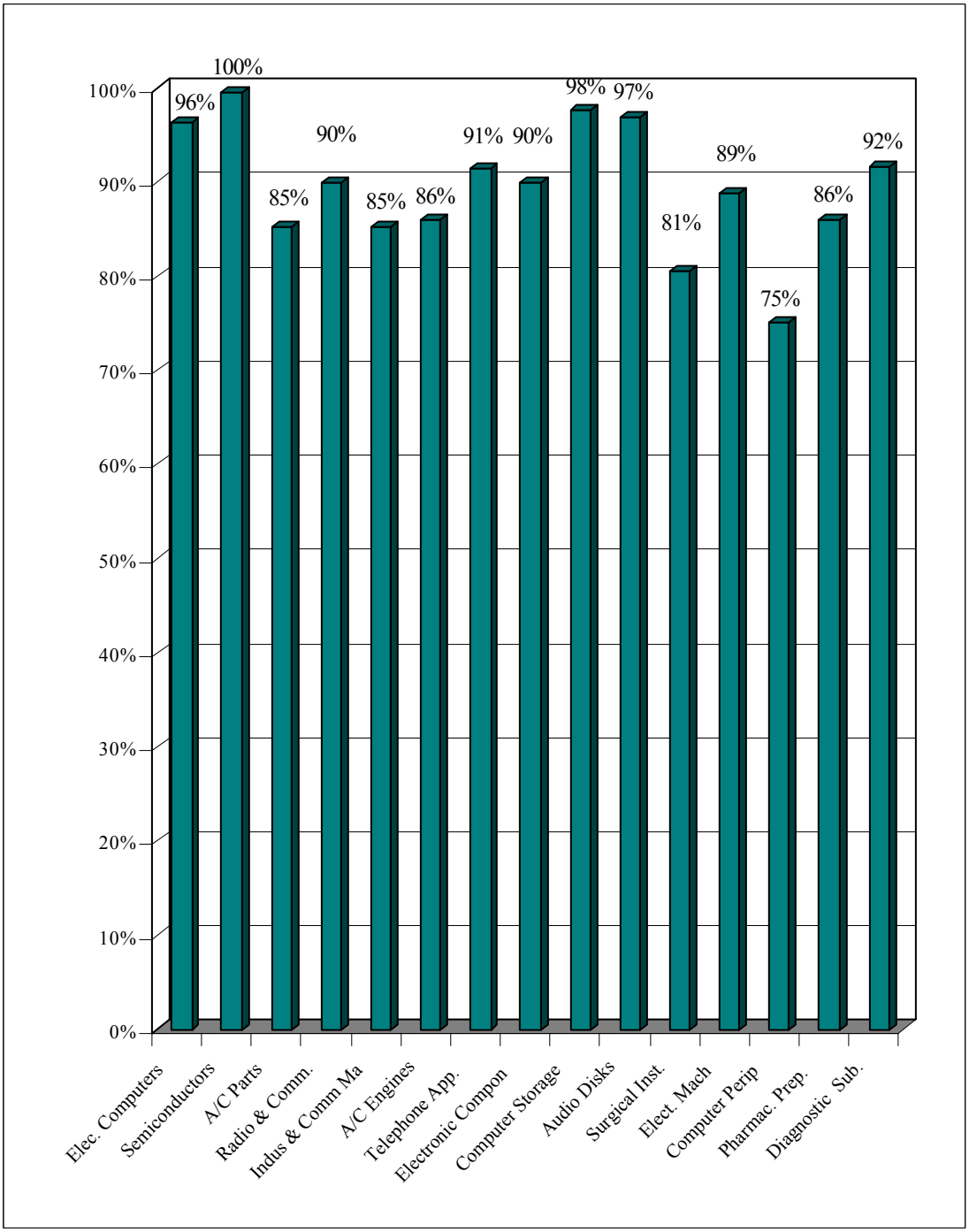
EXHIBIT 5-22: ***U.S. Air Trade by Commodity-Type***



Source: Colography - 2001

…and almost exclusively use air

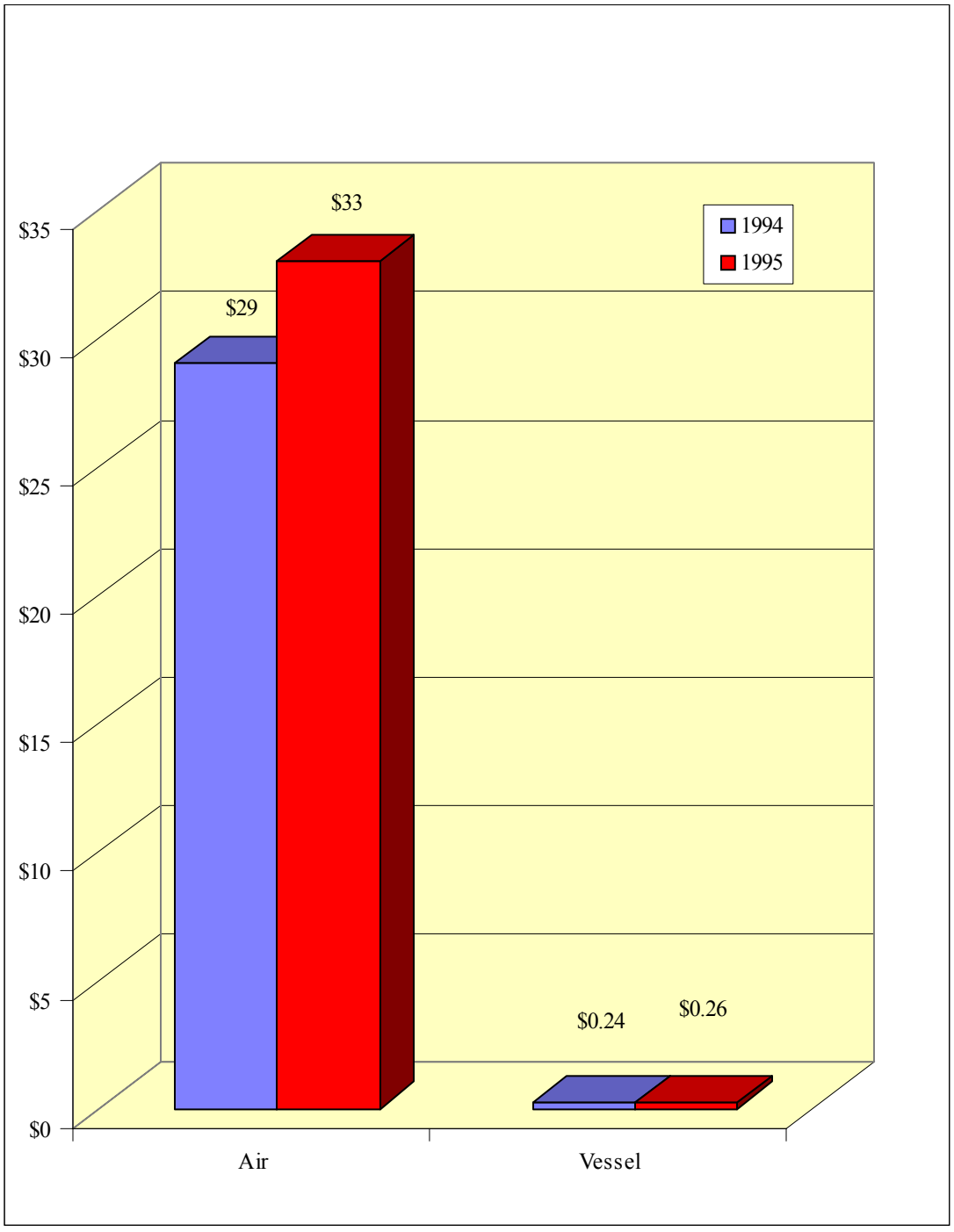
Exhibit 5-23: ***Percentage of Transport by Air***



Source: Colography - 2001

Air Trade is used for relatively more expensive goods…

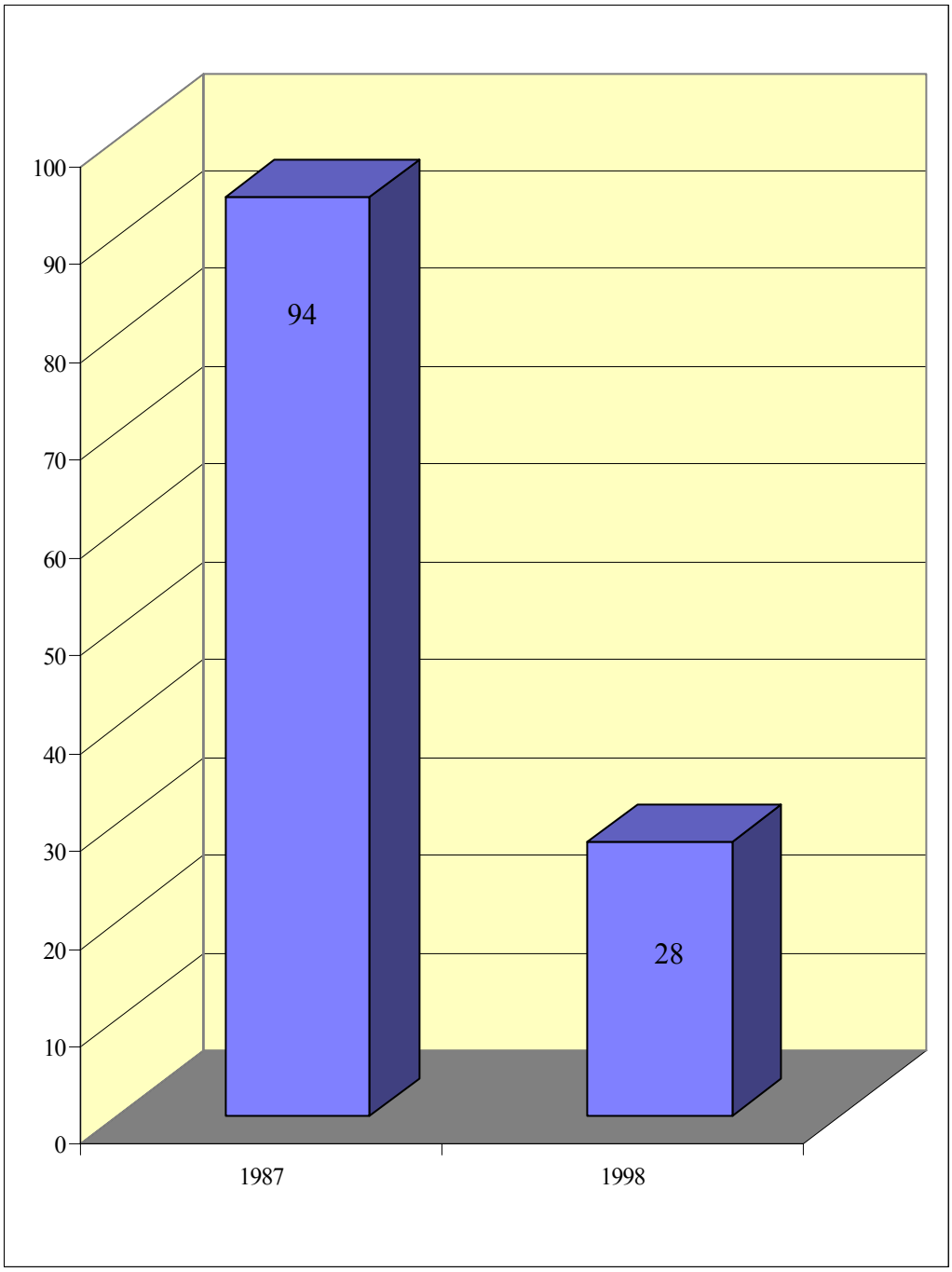
EXHIBIT 5-24: ***Dollar Value Per Pound Shipped, Air Trade vs. Vessel***



Source: Colography - 2001

…that are getting shipped in smaller units

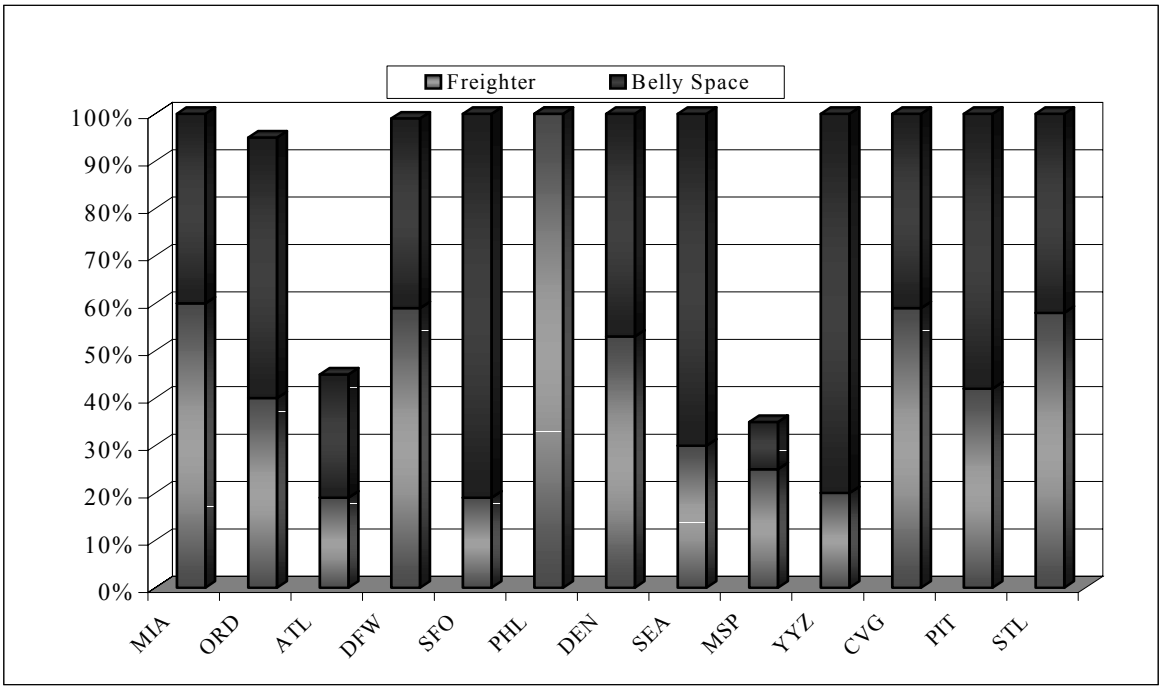
EXHIBIT 5-25: ***Pounds per Shipment – U.S. Air Exports***



Source: Colography – 2001

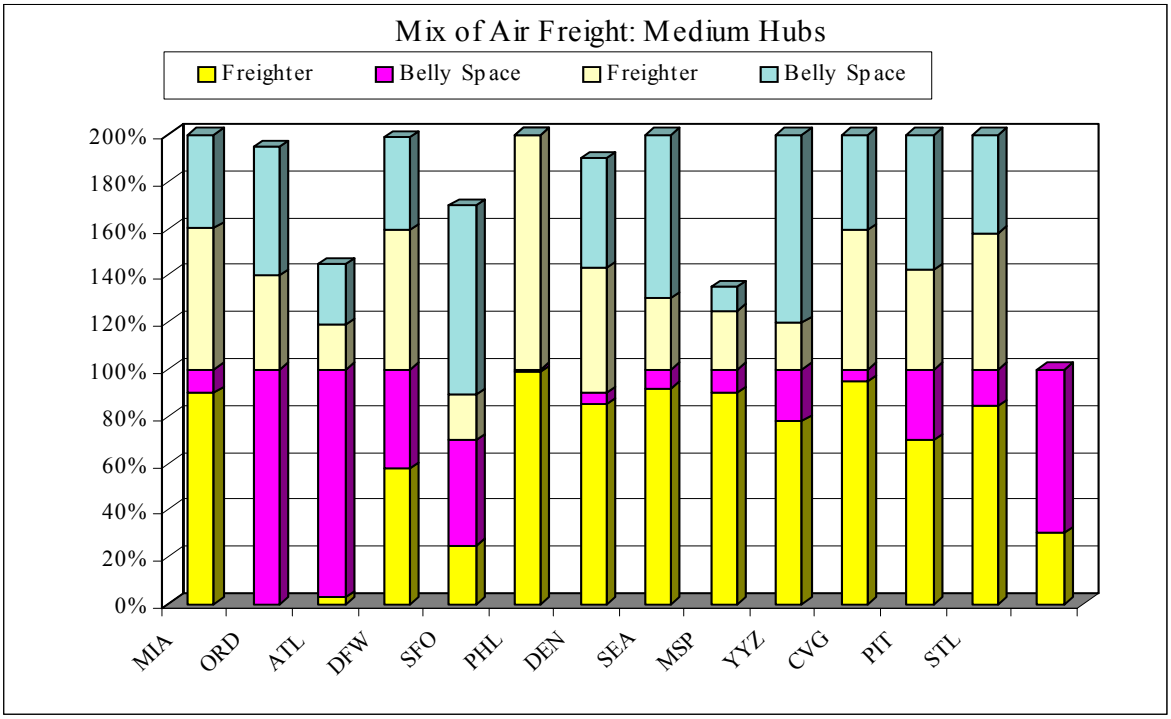
Still, "Belly Space" is a requirement for any significant Cargo Operation

EXHIBIT 5-26: *Mix of Air Freight – Large Hubs*



Source: Air Cargo Statistics – ACI - 2001

EXHIBIT 5-27: *Mix of Air Freight – Medium Hubs*



Source: Air Cargo Statistics – ACI - 2001

Conclusions

- "High Tech" industries are far and away the biggest users of air freight.
- In particular, those industries that utilize Just-In-Time and Quick Response Manufacturing processes almost exclusively use air freight.
- These types of goods are typically expensive.
- Dedicated freight, destined for freighter/express service, typically comprises less than 50% of air freight at most major airports. The balance (>50%) typically are shipped via "Belly Space" and is typically less expensive freight.
- Implication: To generate relatively strong freight demand, two factors must be evident: 1) High Tech industry near by, that drives "high yield" freight demand, and 2) Availability of ample passenger service nearby, that avails itself to low yield "belly space" capacity. These two factors equate to being in or near a largely populated metropolitan area.

5.8.2 CARGO INDUSTRY TRENDS

Relative Pricing = Need for Speed and Reliability

TABLE 5-11: ***North Atlantic Cargo Market***

Product	Door - Door Time	Typical Rate/Lb.
Priority Air	2-3 Days	$1.50
Standard Air	4-7 Days	$0.45-$0.85
Direct Ocean	14-28 Days	$0.06 - $0.12
Standard Ocean	21-35 Days	$0.04 - $0.08

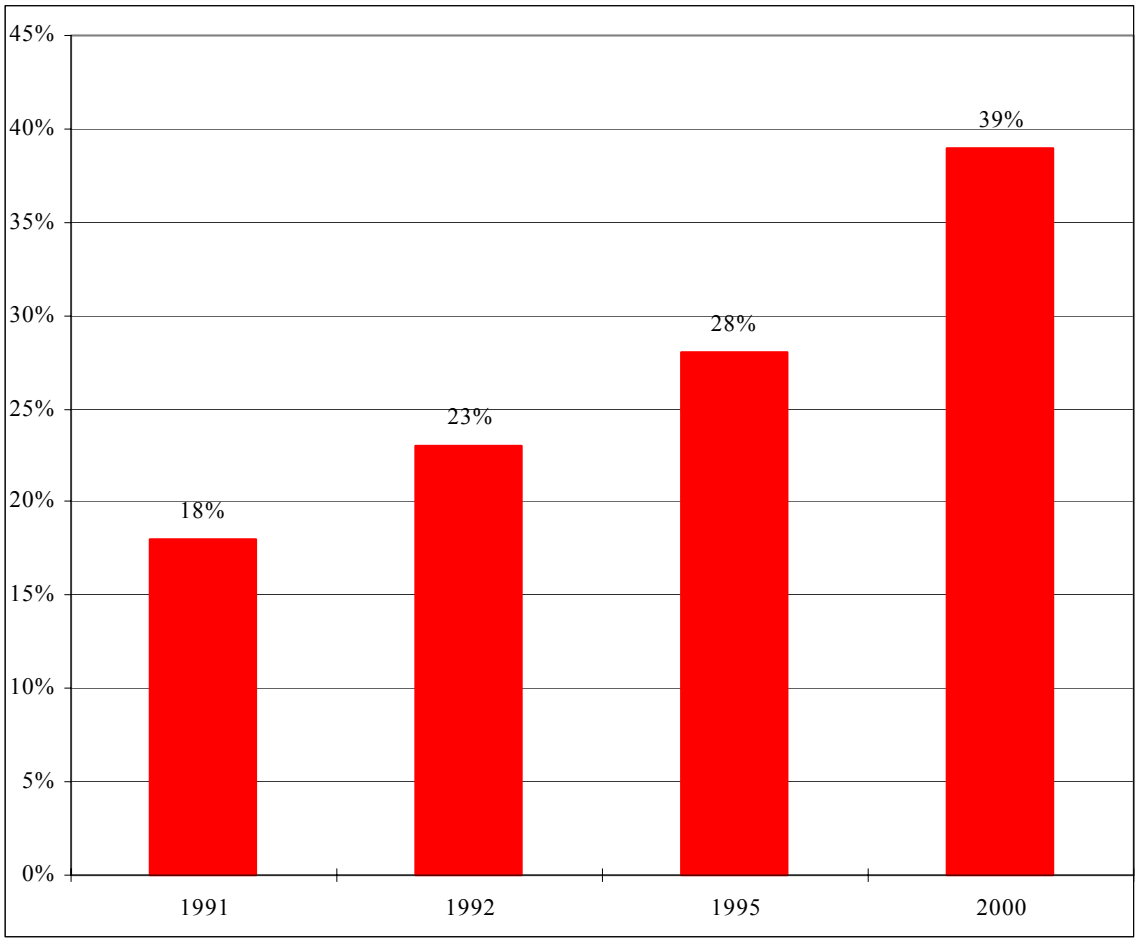
Note price differences

Source: MergeGlobal

Why the "Need for Speed" and Reliability? The increase in JIT/QR Manufacturing

- **Increasing the frequency with which shipments are scheduled**
- **Decreasing the lead time for shipments**
- **Increases in the number of individual shipments**
- **Large increase in the importance of on-time delivery**
- **A shift to faster modes (mostly an international issue)**
- **Within modes, a shift to more reliable carrier (integrated carriers)**
- **Number of supplier & transport companies is reduces by shippers**

EXHIBIT 5-28: ***Percentage of Products Shipped JIT/QR***



Source: Ohio State University via 1995 UPS Annual Report.
JIT = Just-In-Time inventory and Quick Response Manufacturing Technique

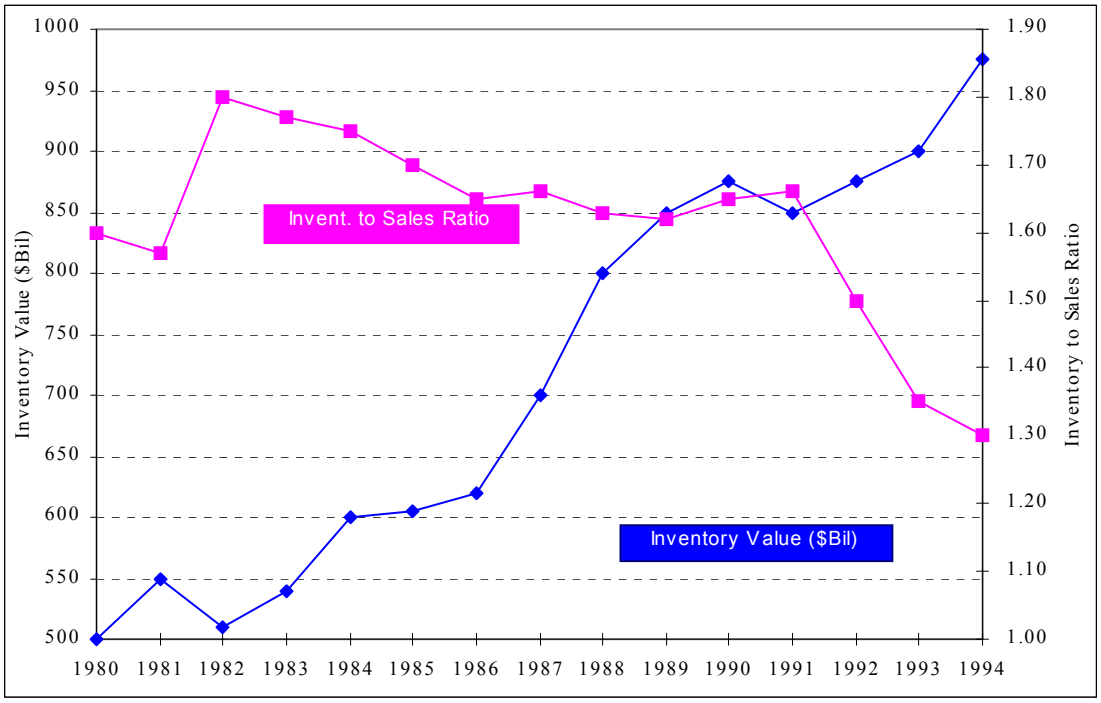
What is J-I-T and QR Manufacturing?

Just-in-time (JIT) or Quick Response (QR) are manufacturing processes that essentially abolish (or at least minimize) inventories of goods or raw materials. Typically, JIT or QR are utilized more aggressively as the cost of inventories (i.e. expensive goods) increases.

Why this manufacturing change?

It is cheaper to use overnight air than to carry expensive inventory.

EXHIBIT 5-29: ***Inventory to Sales Ratio***

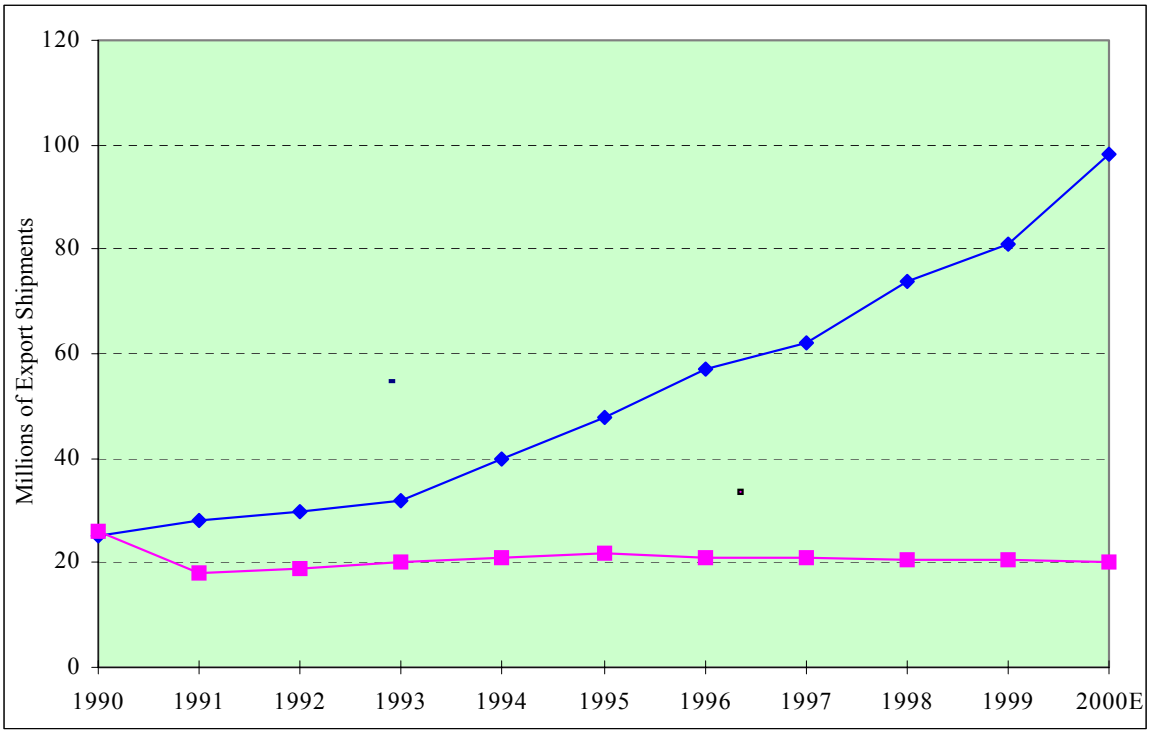


Source: Colography

Much of the problem can be traced to technology; it is more expensive for a company to carry large quantities of lightweight, $2,000 laptop computers in inventory than to carry bulky, outdated type-writers that retail for a fraction of the cost.

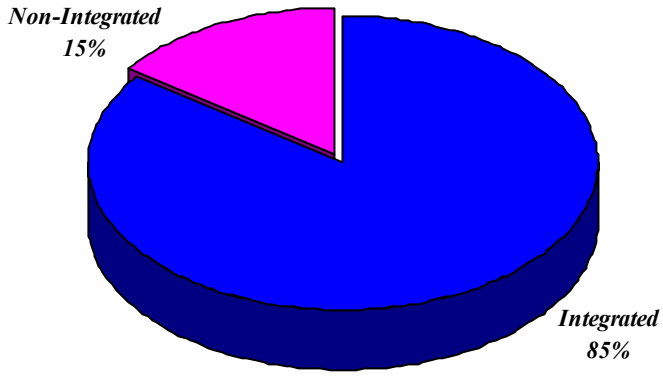
Because of this time-sensitive nature, integrators are taking over.

EXHIBIT 5-30: ***Export Shipments by Carrier***



Integrated Carriers are defined as those that provide seamless, door-door service. They are considered the most reliable, service-oriented. Examples: Federal Express, UPS, Airborne, Emery, DHL & Burlington

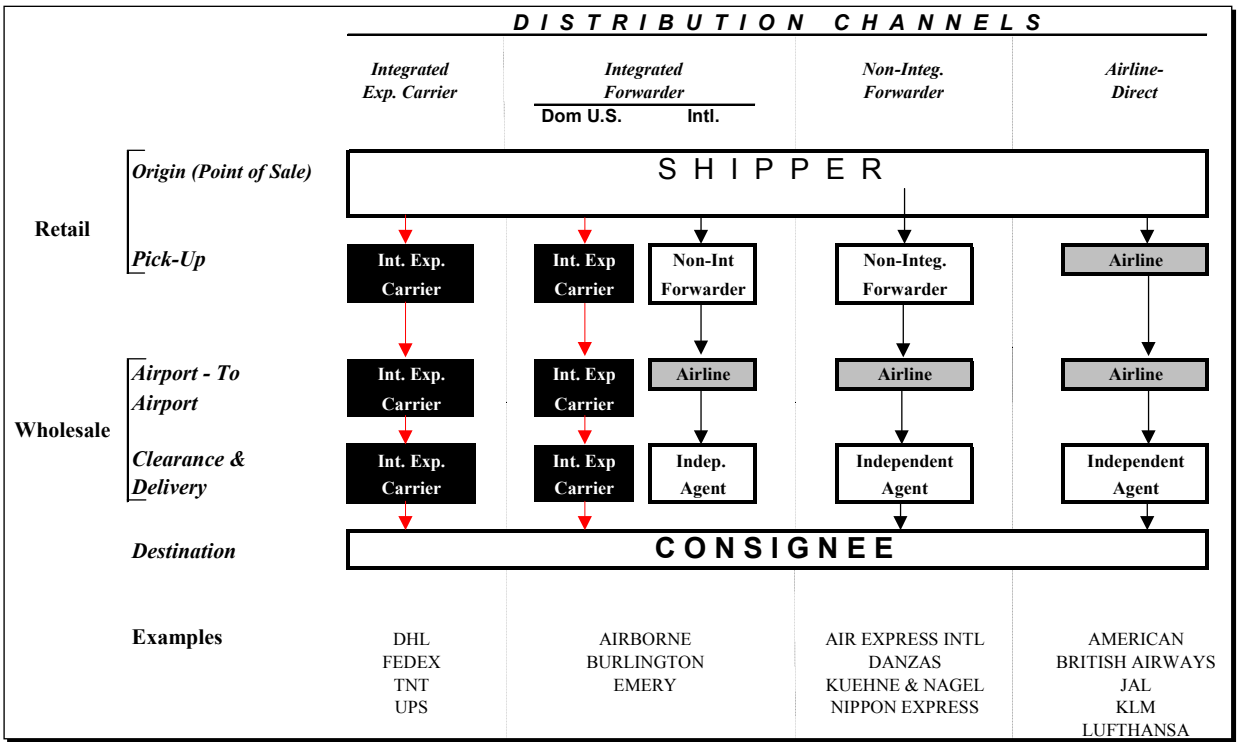
Domestic Market Share



Source: MergeGlobal - 2001

Chart below displays typical Air Freight Distribution Channels

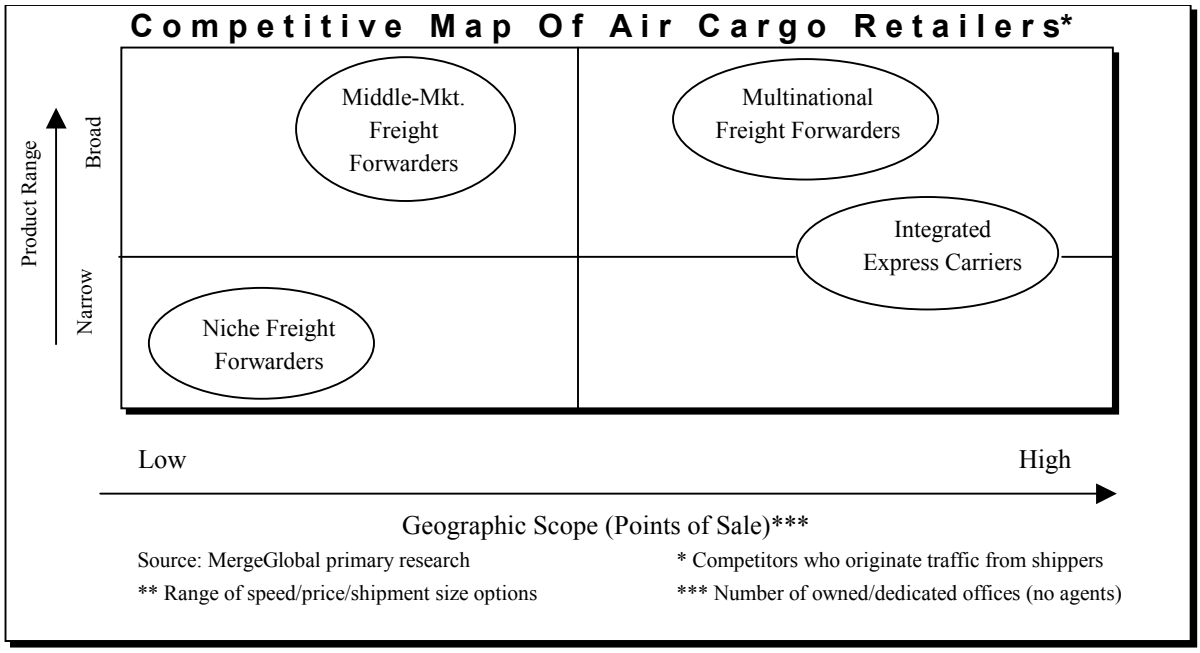
EXHIBIT 5-31: *Air Freight Distribution Channels*



Source: MergeGlobal - 2001

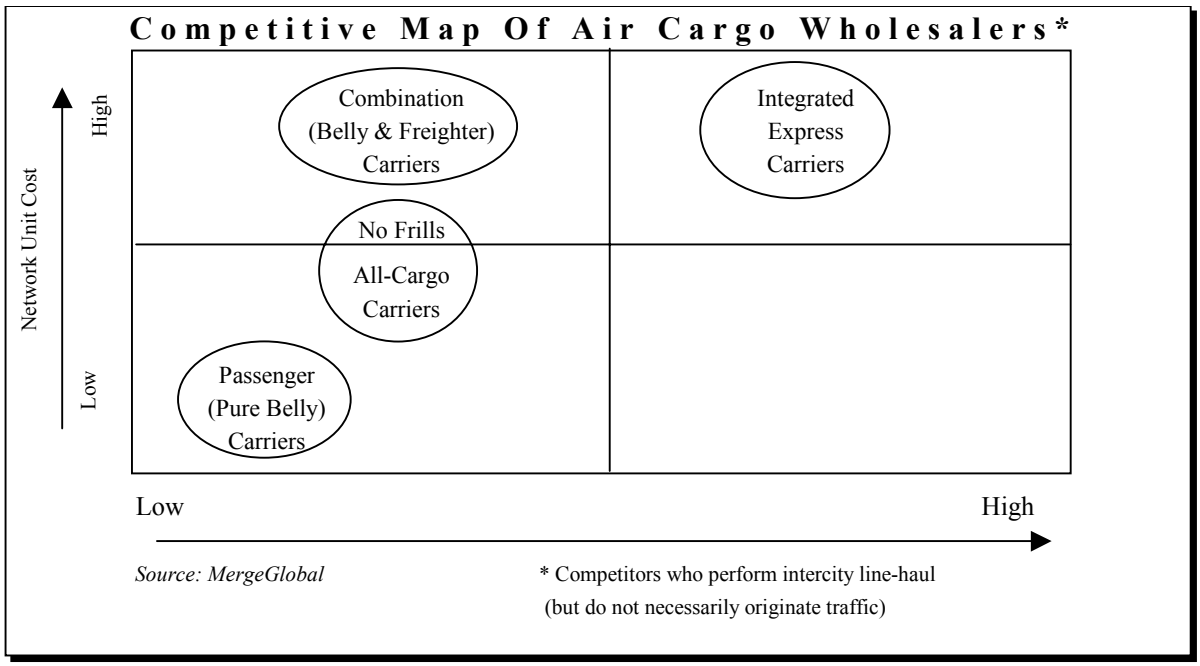
Integrated Carriers operate at the "high-end" of the air cargo market

EXHIBIT 5-32: ***Competitive Map of Air Cargo Retailers***



Source: Merge Global - 2001

EXHIBIT 5-33: ***Competitive Map of Air Cargo Wholesalers***



Source: Merge Global – 2001

Integrated Carrier Specific Commentary

Federal Express Largest aircraft fleet of Integrators. Primary hubs in Memphis, London-Stansted, Paris (CDG),Subic Bay (Philippines), Tokyo (NRT), Taipei (Taiwan) and Dubai (Middle East). Regional U.S. hubs are located at Indianapolis, Newark, Oakland, Los Angeles, Chicago, and Anchorage. Federal Express is very profitable in the domestic U.S. market, but has struggled in Asia for years.

UPS Revenue base doubles that of their next biggest competitor, due to UPS' massive ground fleet advantage. UPS operates their primary domestic hub at Louisville (SDF), with regional hubs at Philadelphia, Columbia, South Carolina, Dallas-Fort Worth, Rockford (Illinois), and Ontario (California). UPS operates Anchorage as their Pacific gateway, with direct service to Tokyo, Hong Kong, Korea, Singapore, Malaysia and Taiwan. Pacific hub at Taipei, Taiwan; Atlantic hub in Cologne, Germany. While UPS dominates the domestic U.S. market, they lag in the international arena, and recent facilities investment/strategic moves indicates they are aggressively targeting Asia. announced long-term marketing and operating agreement with Nippon Cargo (who was recently granted 30 additional landing slots from Japan to the U.S.)

DHL Number 3 integrated carrier in the world. Privately held and difficult to get information on.Relatively large player in intra-Europe, intra-Asia, and Middle East markets. Biggest obstacle is the fact that they are a niche player in the domestic U.S. market, garnering only about 2% of that market; major DHL hubs are Cincinnati, Brussels (Belgium), and Manila (Philippines). Apparently are largest European integrated carrier and are believed to be quite profitable on this continent.

Emery

Subsidiary company of Consolidated Freightways (whose primary business is nationwide U.S.trucking); Emery's primary U.S. hub is located at Dayton, Ohio; Regional hubs at Charlotte, Chicago, Dallas Fort-Worth, Los Angeles, Orlando, Nashville, Sacramento, and Newburgh, New York (Stewart Airport); Emery also serves Europe with a hub located at Brussels, Belgium; Emery has dedicated aircraft and trucks that support service across Europe. $1.8 billion revenue base. but is dwarfed by Federal Express and UPS. More focused on heavy freight (relative to parcel-dominated Federal Express and UPS) and competes primarily in this market with BAX. Emery continued

Burlington Air Express (BAX)

Fully integrated domestic carrier (not internationally, as BAX does not fly their own aircraftoverseas and must rely on outside contractors). Burlington Air Express is a subsidiary of Pittston Burlington Group (whose principal business evolves around coal and mineral operations). BAX has a $1.2 billion revenue base, with international operations generating about 57% of revenues (and growing). BAX hub is located at Toledo, Ohio. Focuses on relatively heavy freight, with 5% geared towards auto industry (down from 20% a few years ago).

Airborne Express

Fully integrated domestic carrier (not internationally). "Variable Cost Approach" to international business. Wilmington, Ohio is major hub. $2.2 billion revenue base. DC8 operator. Focuses on 5 lb. or less shipment (similar to Federal Express and UPS, less like Emery and BAX).

Conclusions

- Integrated carriers, who already dominate the domestic air freight industry, are beginning to do the same in the international air freight market.

- Why? The requirement by industry for "time definite" services. Time definite example: an automobile part needed for an auto plant manufacturing line. If that part doesn't arrive on schedule, the whole line shuts down – costing A LOT of money.

- Why are companies doing this? It is cheaper than carrying the cost of the inventory. Again, primarily applies to "high-tech" industries.

- Companies are willing to pay a huge premium for the ability to ship goods on short notice and with a high degree of confidence. Note relative price differences (charged by air freight/ other transportation delivery modes).

- As noted earlier, this is a trend toward dedicated cargo operations in secondary airports near major metropolitan areas.

5.8.3 WHAT INDUSTRY TRENDS MEAN FOR ARIZONA

Comment

- As noted earlier, cargo operations typically gravitate toward large metropolitan areas (for previously discussed reasons).

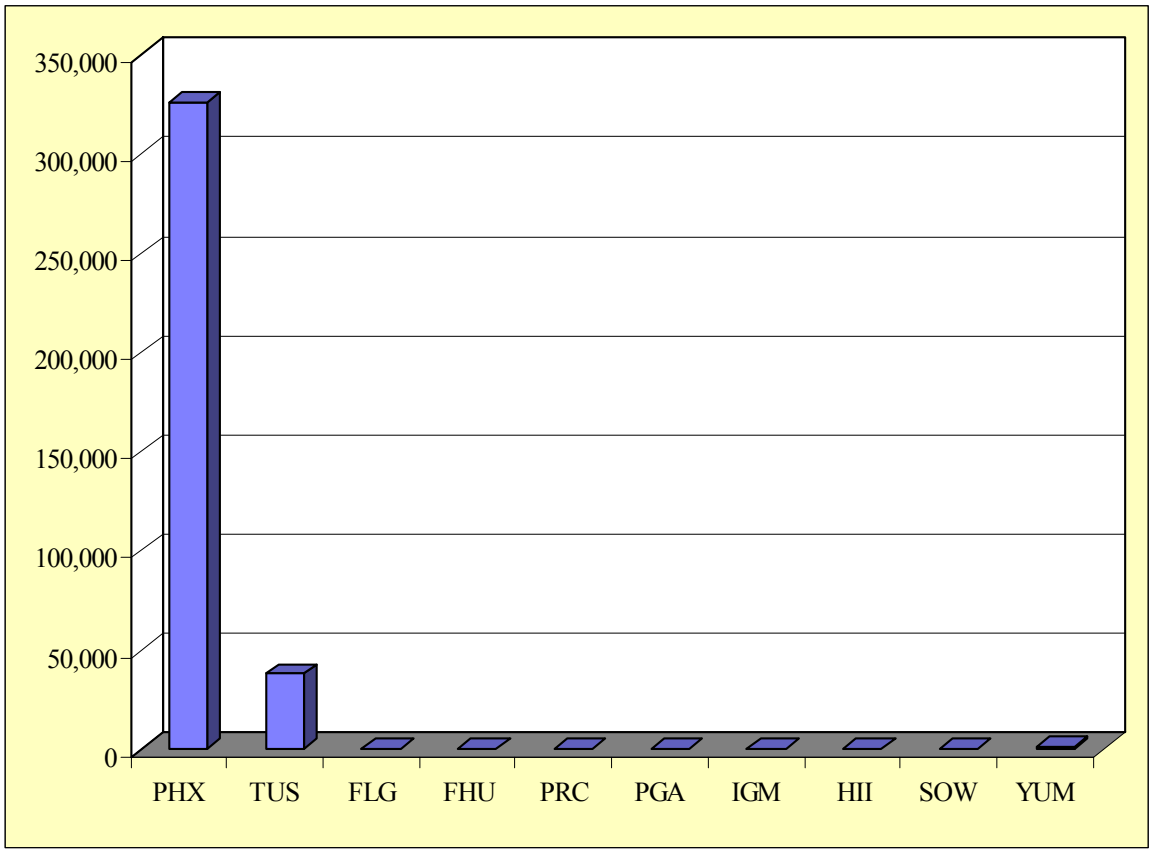
- Given that, Phoenix (PHX) stands out as the only real viable cargo growth market in the State of Arizona.

- Tucson (TUS) has limited opportunities (in part, due to its decent size and potential NAFTA-related growth), but given the industry in/around Tucson, TUS won't experience anything like what Phoenix could.

- All other Arizona markets are probably going to have to rely primarily on truck feeder growth, as they are not big enough to support much in the way of air freight growth.

Phoenix (PHX) dominates the current Arizona air cargo market

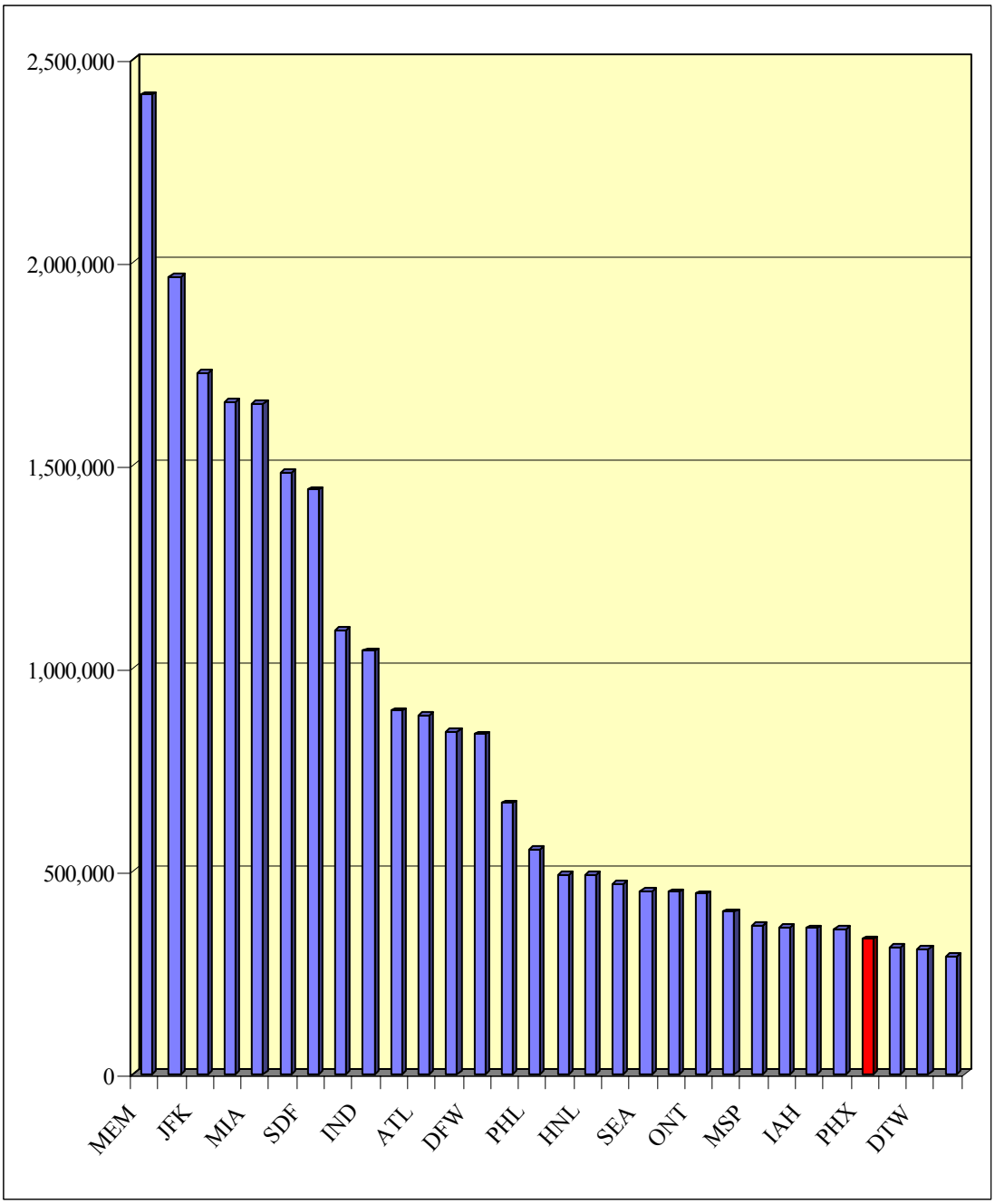
EXHIBIT 5-34: ***Phoenix (PHX) tons Shipped – YE1999***



Source: ACI Cargo Activity Statistics - 2001

PHX is the largest cargo (volume) airport in the U.S. . . .

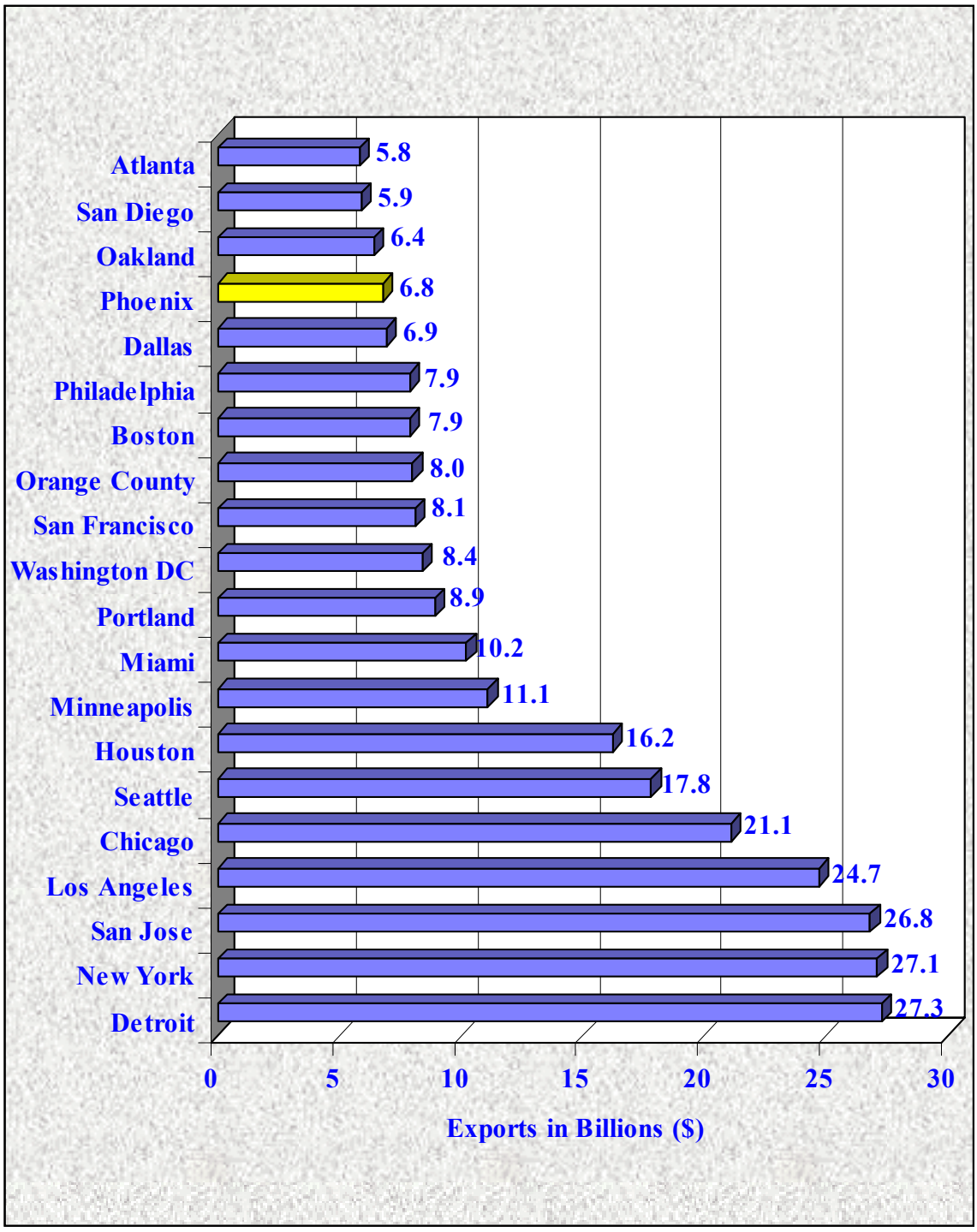
EXHIBIT 5-35: ***Top 30 Cargo Markets in the U.S. – 1999 (Metric Tons)***



Source: ACI Cargo Activity Statistics - 2001

… and Phoenix is the 19th largest export market in the U.S. …

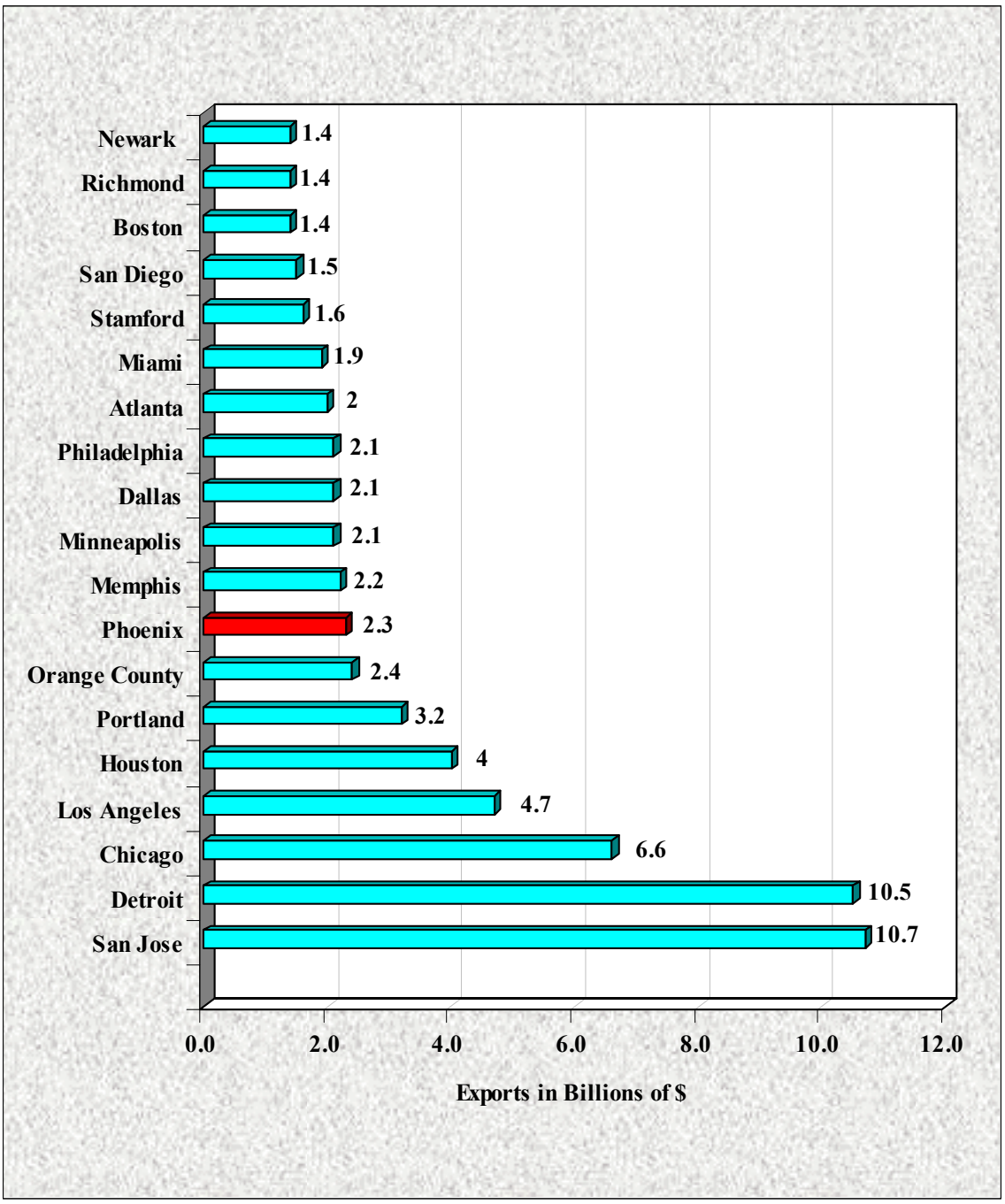
EXHIBIT 5-36: ***Top 25 U.S. Export Markets***



Source: U.S. Dept. of Commerce - 2001

… and is also one of the fastest growing export markets in the U.S.

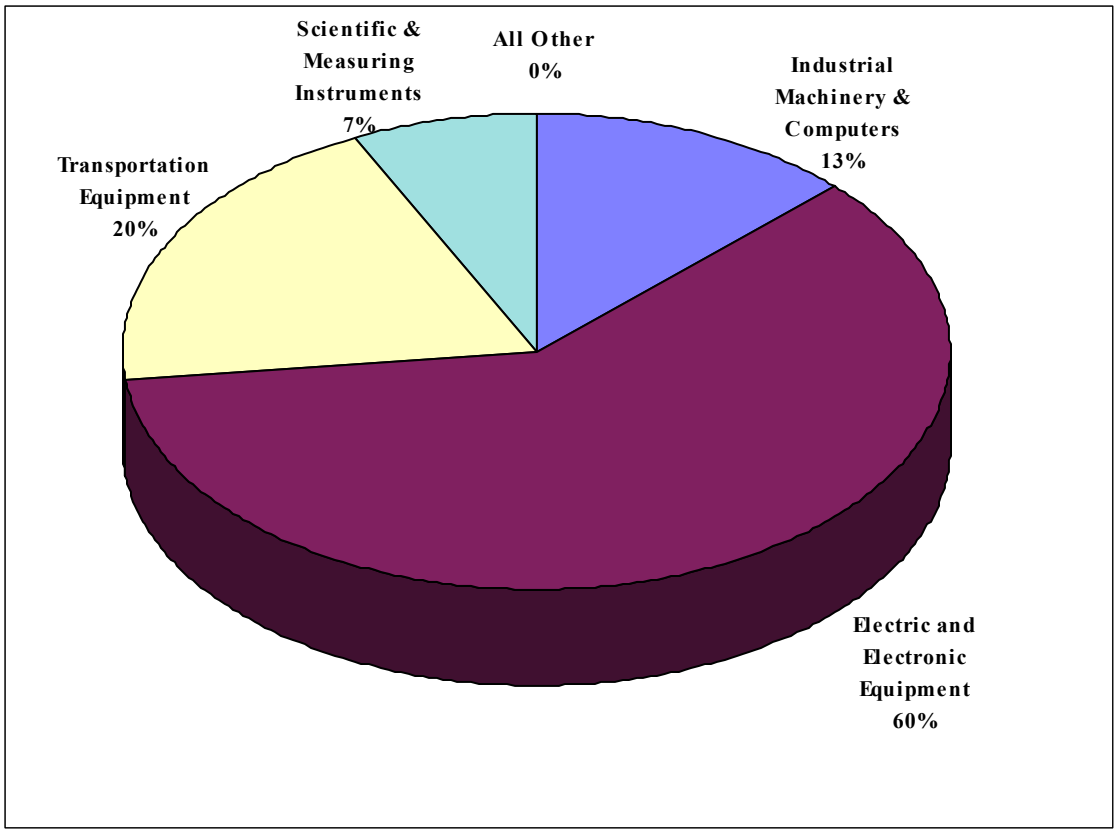
EXHIBIT 5-37: ***Greatest Gains (in dollars) for Metro Areas – 1999 vs. 1993***



Source: U.S. Dept. Of Commence - 2001

Why does PHX generate so much air cargo: High Tech Industry in PHX

EXHIBIT 5-38: ***Phoenix Air Cargo (1999) by Commodity-Type***



Source: U.S. Dept. of Commerce - 2001

Other reasons Phoenix should be the cargo "hub" for Arizona

- Large metropolitan area.
- Significant base of technology-related industry (Intel, Honeywell).
- Significant passenger service at PHX, creating significant low-yield belly space alternatives.
- Good weather – ties to strong operational reliability.
- Good highway access to both PHX and potentially WGA.

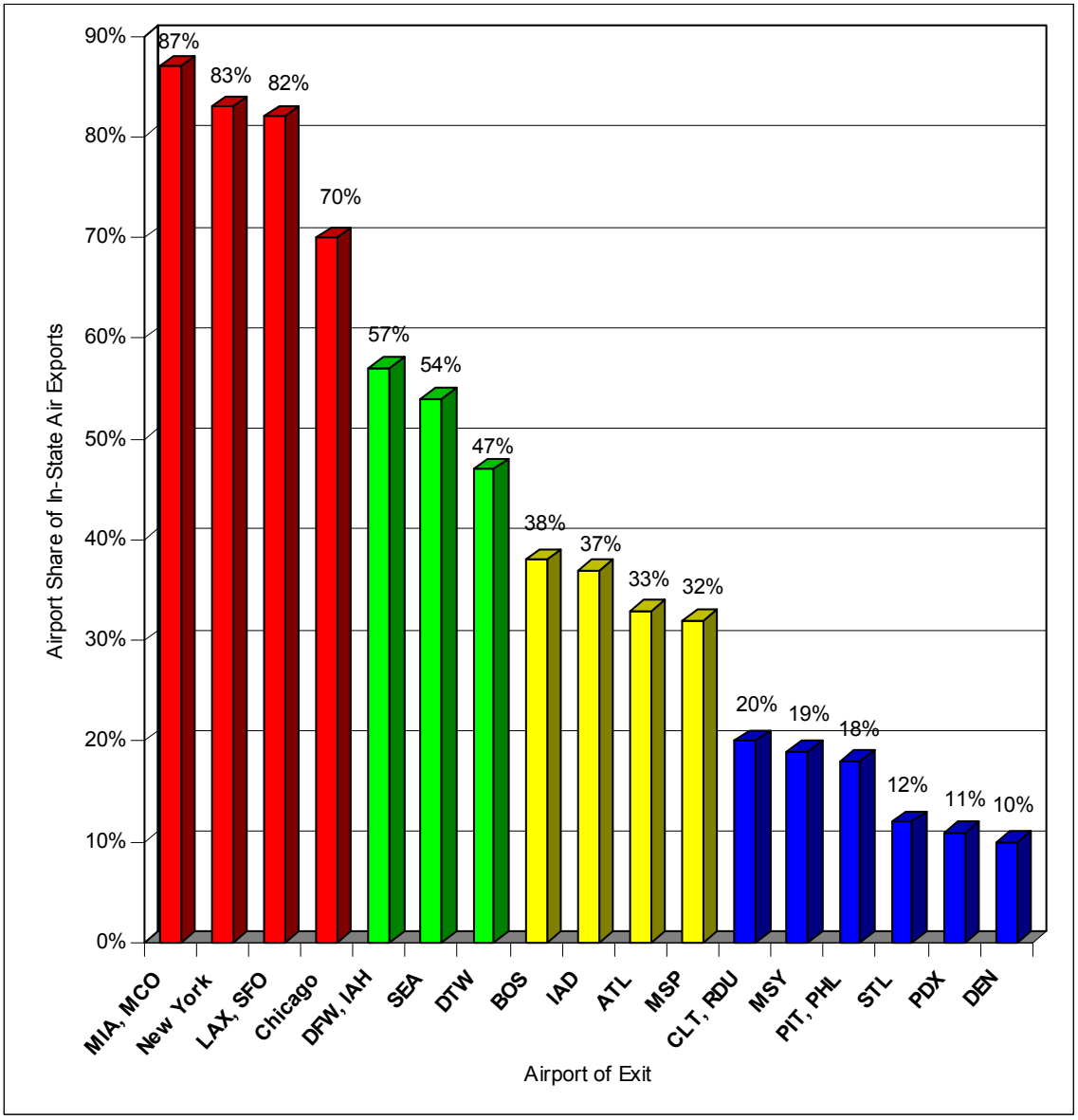
Conclusions

- **Industry trends are pretty clear: Cargo growth from the State of Arizona will have to come from Phoenix**.
- **One question is whether PHX is a viable growth option for cargo or whether another airport – like WGA – presents better long-term cargo growth potential.**

5.8.4 PHOENIX ALTERNATIVE: WILLIAMS GATEWAY AIRPORT (WGA)

Many major cities witness cargo leakage to the big centers such as LAX & ORD. Why?

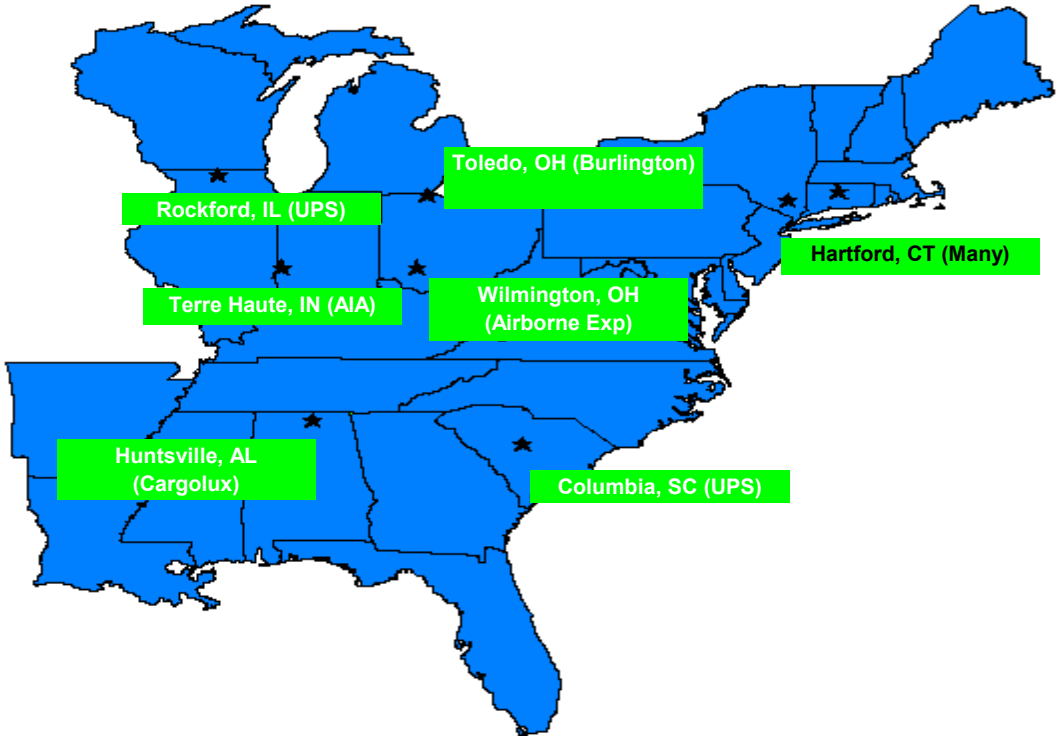
EXHIBIT 5-39: ***Share of State Air Exports (lbs.) at In-State Airports***



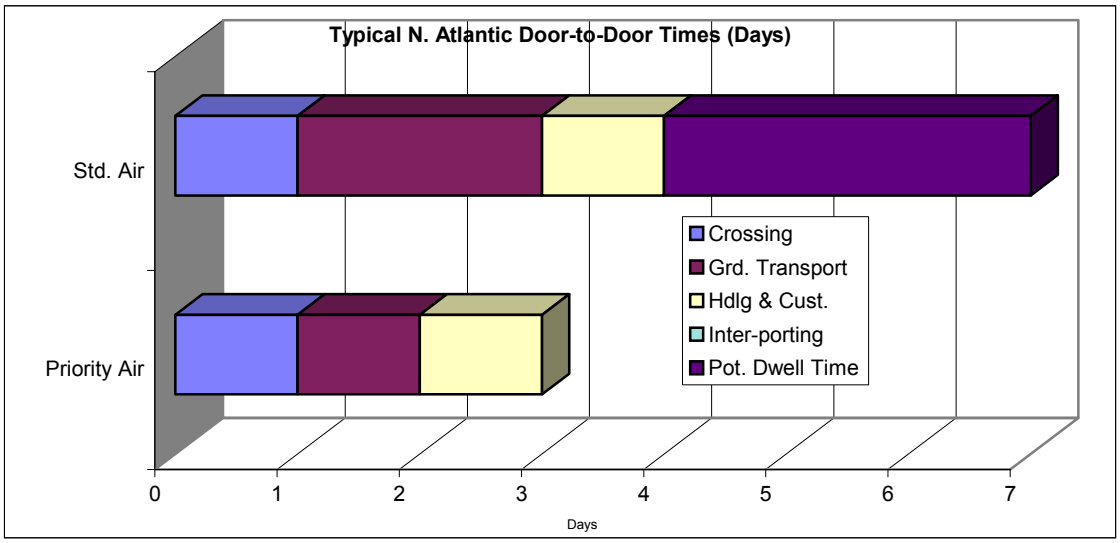
Source: U.S. Bureau of the Census Foreign Trade Statistics - 2001

1) **Lack of dedicated cargo facilities**
2) **Potential for ground "gridlock"**
3) **Lack of space**
4) **Relative costs?**

Recent air cargo trend: Hubbing of "lesse" airports in major metro areas



Why? Major delays at major U.S. gateways …



Source: *Merge Global - 2001*

… and relatively high operating costs at "major airports"

Cost Element	IAD	JFK
Landing Costs	$1,027	$2,360
Airport Fee	$0	$601
Intro-Plane Fuel Fee	$632	$772
Freight A/C Handling	$2,000	$3,200
Cargo Handling	$5,250	$8,250
Apron Fee	$280	$550
On Airport Facilities (Annual)	$330,000	$370,000
Utilities (Annual)	$33,600	$40,000
Weekly Cost of an Air Cargo Operation with 4 scheduled trips/week	**$52,937**	**$86,550**

Finally, WGA facilities appear to make it a strong candidate for air cargo

- **Runway Capacity**
  - Current: 3 parallels
  - Planned: Increased length and separation
- **Expansion Space Available**
  - 4,000+ acres with on-site cargo facilities planned
- **Operational Support Infrastructure**
  - On-site aerospace center to support maintenance, manufacturing and modification
- **Intermodal Access**
  - On-site rail (Union Pacific)
  - Potential for light rail, high-speed transit, etc.
  - Planned road access and highway improvements

5.9 REGISTERED GENERAL AVIATION AIRCRAFT

Methodology

Registered general aviation aircraft were forecast by county and were primarily based on the forecasts of licensed pilots that were prepared in the SANS 1995. Through discussions with members of the project Planning Advisory Committee, it was determined that the SANS 2000 general aviation forecasts would be based on the rate of growth established previously for the 1995-2015 planning period. However, the point of beginning for the forecasts would be based on current registration and basing information which has been obtained in the inventory/data collection phase of this study.

Overall, and based on this forecasting methodology, growth in registration of single-engine aircraft is proportional to the growth in general aviation licensed pilots. Growth in multi-engine aircraft, including multi-engine piston, turboprop and jet aircraft, is proportional to growth in the number of commercial and air transport pilots; and growth in other aircraft, which includes mainly helicopters and gliders, is proportional to general aviation pilots.

These forecasts are forecasts of change. Arizona DOT registered aircraft by county were obtained from the Division of Aeronautics and used to determine the change in registered aircraft. In the two metropolitan counties, new Regional Aviation System Plans will become available, and their forecasts of aircraft will be used as provided.

Base Data

The FAA maintains an airport data base developed through the completion of FAA Form 5010. Completion of these forms is a responsibility of the Arizona DOT, Aeronautics Division. Copies of these forms were obtained for all of the airports concerned. These forms inventoried based aircraft, as of 1998, in categories which were compatible with the three categories forecast.

Arizona Registrations

All aircraft based in Arizona must register with the Arizona DOT. That registration form includes specification of the airport at which the aircraft is based.

5.10 BASED AIRCRAFT BY AIRPORT

In order to determine needs at airports, forecasts of aviation activity are necessary by individual airport. The county totals described above have been allocated to airports for use in the NEEDS determination.

Methodology

There were several factors that were used to allocate aircraft to individual airports. For the two metropolitan areas, the Regional Aviation System Plan forecasts were used, as provided. For other counties, master plan forecasts were used as guidance, but in nearly every case, these forecasts indicated far more growth in the general aviation fleet than current industry forecasts suggest, or than current aircraft manufacturing could support. For multi-engine aircraft, airport capabilities were also considered.

Based aircraft by type for the non-metropolitan are shown on Exhibits 5-40 to 5-43. The base data were the FAA Form 5010 and Arizona DOT registration data described above, as well as from information gathered through the airport sponsor surveys sent out in June, 1999. In addition, many of the airports in the system currently have no based aircraft, but serve important access functions, including Medivac, with Arizona's long distances and sparsely populated areas. For many of these airports, lacking indication to the contrary, no based aircraft were forecast. Total based aircraft by airport are shown on Tables 5-12 to 5-15.

Operations

General aviation operations per based aircraft were calculated from the FAA Form 5010 data for 1998 and from recent survey information, and maintained as constant over the forecast years. Where no historic operations data were available, a constant 200 operations/based aircraft was assumed. Where there were no based aircraft, a minimum 200 operations was assumed at the airport. The results are shown in Table 5-16.

Military Operations

Military operations have been recorded at 21 non-metropolitan airports according to the FAA Form 5010. These include Sierra Vista, Coolidge and Yuma, joint use facilities. In addition, the MAG Regional Aviation System Plan forecasts operations at Luke AFB, Papago AFB and Sky Harbor International, and the PAG Regional Aviation System Plan forecasts operations at Davis-Monthan AFB. Most civil forecasts of military activity assume constancy. This assumption has been used for this study.

Fleet Mix by County

Exhibit 5-40 tabulates the forecast total aircraft by county for the forecast years 2000, 2005, 2010, 2015, and 2020.

These forecasts were further detailed by the three categories of single-engine piston, multi-engine and other, as illustrated on Exhibits 5-41 to 5-43.

EXHIBIT 5-40: ***Forecast Total Based Aircraft by County 1998-2020***

	1998	2000	2005	2010	2015	2020	% of Total (2020)
Apache	35	36	38	41	44	50	0.56%
Cochise	143	147	156	166	178	188	2.12%
Coconino	219	222	239	260	283	311	3.50%
Gila	167	170	172	176	181	186	2.10%
Graham	34	28	36	38	41	43	0.48%
Greenlee	4	4	4	4	4	4	0.05%
LaPaz	21	21	23	26	30	32	0.36%
Maricopa	3,857	3,900	4,065	4,303	4,568	4,877	54.95%
Mohave	449	460	492	537	589	649	7.31%
Navajo	105	108	111	121	128	139	1.57%
Pima	893	900	968	1,050	1,140	1,236	13.86%
Pinal	216	225	231	248	267	284	3.20%
Santa Cruz	23	23	26	29	32	36	0.40%
Yavapai	439	440	491	556	627	708	8.00%
Yuma	95	98	104	114	125	137	1.54%
Totals	**6,694**	**6,782**	**7,150**	**7,663**	**8,231**	**8,874**	**100%**

Source BWR Corporation Forecast Analysis - 2001

Percent of Forecast Total Based Aircraft by County 2020

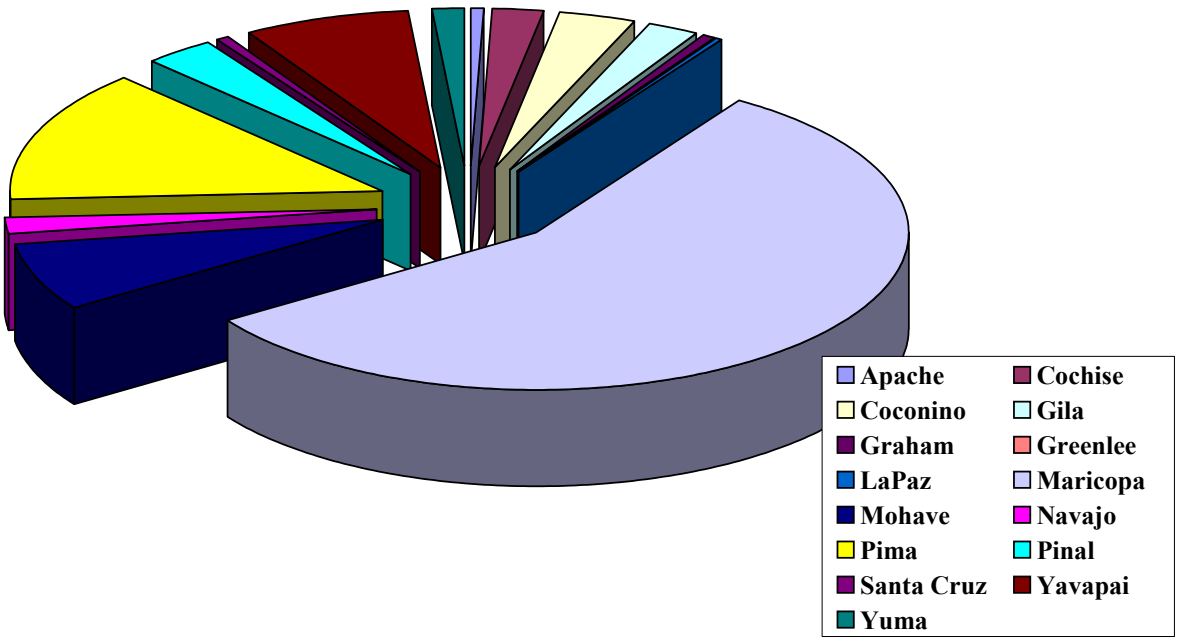


EXHIBIT 5-41: ***Forecast Single-Engine Piston Based Aircraft by County 1998-2020***

	1998	2000	2005	2010	2015	2020	% of Total (2020)
Apache	30	31	33	36	39	43	0.65%
Cochise	113	115	124	132	139	148	2.25%
Coconino	154	158	166	180	198	215	3.27%
Gila	104	105	108	112	117	132	2.01%
Graham	21	21	23	24	26	28	0.43%
Greenlee	4	4	4	4	4	4	0.06%
LaPaz	18	18	19	19	19	20	0.30%
Maricopa	2,819	2,908	3,064	3,227	3,400	3,520	53.50%
Mohave	309	310	339	374	412	456	6.93%
Navajo	80	80	86	91	97	104	1.58%
Pima	698	800	857	912	971	1,020	15.50%
Pinal	93	95	96	101	109	111	1.69%
Santa Cruz	15	15	17	20	22	26	0.40%
Yavapai	397	400	446	503	566	640	9.73%
Yuma	78	80	86	94	103	113	1.72%
Totals	**4,933**	**5,140**	**5,468**	**5,829**	**6,222**	**6,580**	**100%**

Source: BWR Corporation Forecast Analysis - 2001

Percent of Total Forecast Single-Engine Piston Based Aircraft by County 2020

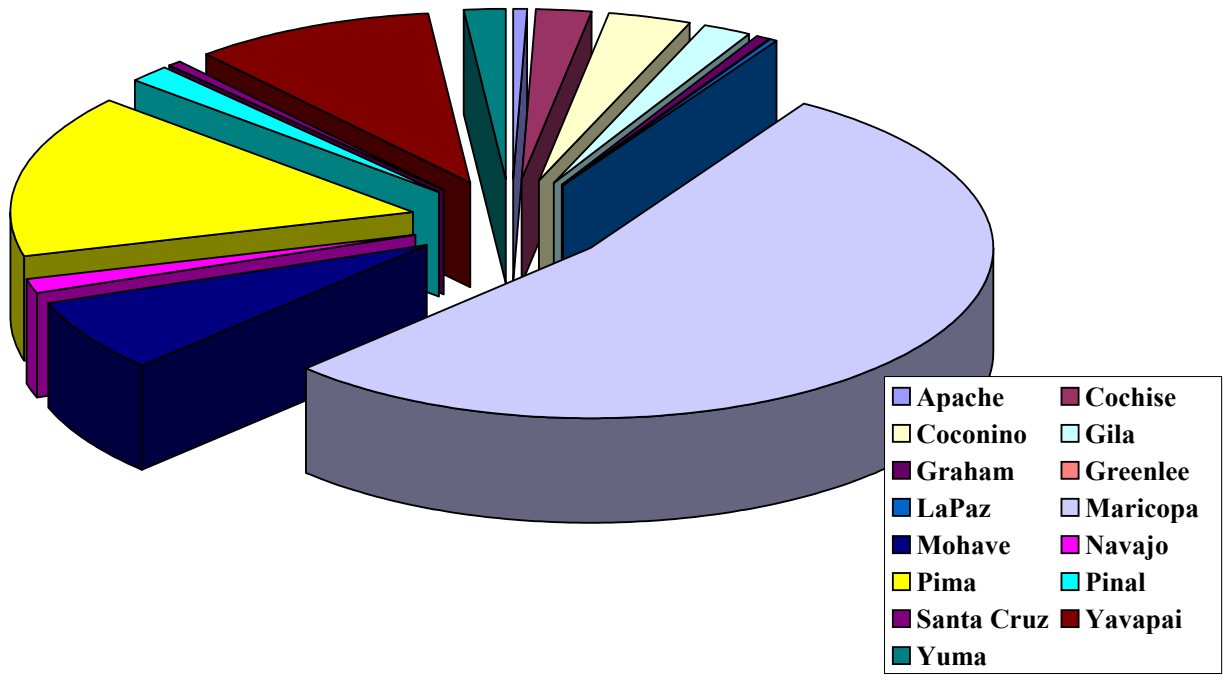


EXHIBIT 5-42: ***Forecast Multi-Engine Based Aircraft by County 1998-2020***

	1998	2000	2005	2010	2015	2020	% of Total (2020)
Apache	4	4	4	4	4	4	0.31%
Cochise	18	18	19	19	20	21	1.64%
Coconino	28	28	30	32	35	38	2.96%
Gila	7	7	7	8	8	8	0.62%
Graham	7	7	7	8	8	8	0.62%
Greenlee	0	0	0	0	0	0	0.00%
LaPaz	0	0	0	0	0	1	0.08%
Maricopa	434	477	529	587	651	712	55.45%
Mohave	128	130	134	142	150	160	12.46%
Navajo	21	21	22	23	27	29	2.26%
Pima	129	147	158	169	180	195	15.19%
Pinal	15	15	15	16	16	17	1.32%
Santa Cruz	8	8	9	10	11	12	0.93%
Yavapai	38	39	42	47	52	57	4.44%
Yuma	16	16	17	19	21	22	1.71%
Totals	**853**	**917**	**993**	**1,084**	**1,183**	**1,284**	**100%**

Source: BWR Corporation Forecast Analysis - 2001

Percent of Forecast Multi-Engine Based Aircraft by County 2020

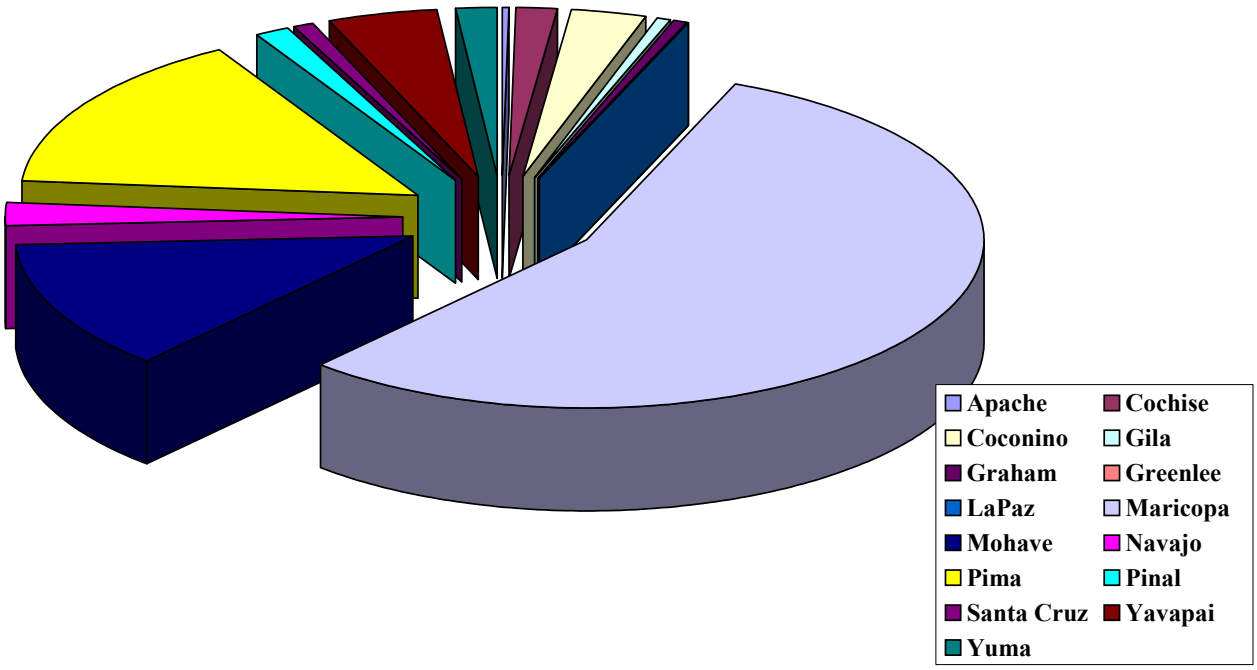


EXHIBIT 5-43: ***Forecast Other Based Aircraft by County 1998-2020***

	1998	2000	2005	2010	2015	2020	% of Total (2020)
Apache	1	1	1	1	1	2	0.18%
Cochise	12	12	13	14	16	18	1.59%
Coconino	37	38	42	47	54	61	5.37%
Gila	56	56	56	56	56	56	4.93%
Graham	0	0	0	0	0	0	0.00%
Greenlee	0	0	0	0	0	0	0.00%
LaPaz	1	1	1	1	2	2	0.18%
Maricopa	347	415	482	561	649	724	63.79%
Mohave	12	12	13	14	16	18	1.59%
Navajo	1	1	1	1	1	1	0.09%
Pima	71	81	88	93	99	107	9.43%
Pinal	111	112	116	124	129	137	12.07%
Santa Cruz	0	0	0	0	0	0	0.00%
Yavapai	4	4	5	5	6	8	0.70%
Yuma	1	1	1	1	1	1	0.09%
Totals	**654**	**734**	**819**	**918**	**1,030**	**1,135**	**100%**

Source: BWR Corporation, Forecast Analysis - 2001

Percent of Forecast Other Based Aircraft by County 2020

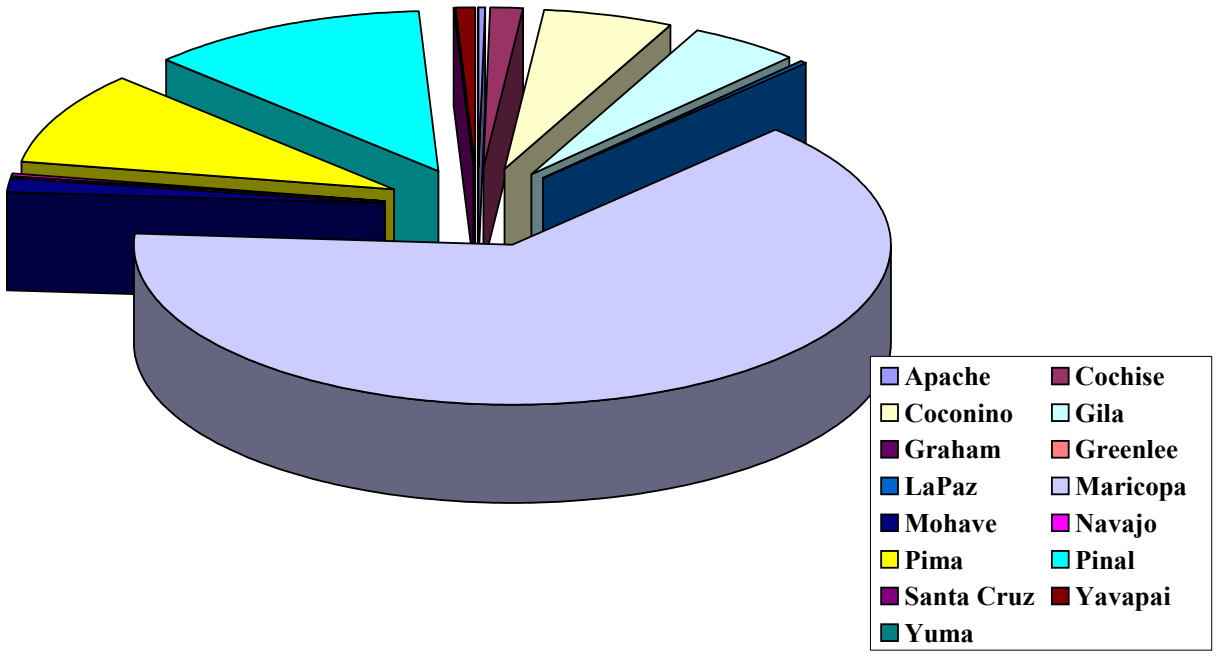


TABLE 5-12: ***Forecast Total Based Aircraft by Airport 1998-2020***

County	Airport	City	1998	2005	2010	2015	2020
Apache			**35**	**38**	**41**	**44**	**50**
	Chinle Municipal	Chinle	2	2	2	2	2
	Ganado	Ganado	0	0	0	0	1
	St. Johns Industrial Airpark	St. Johns	9	9	10	10	11
	Town of Springerville Municipal	Springerville	16	17	18	19	20
	Window Rock	Window Rock	8	10	11	13	16
Cochise			**143**	**156**	**166**	**178**	**188**
	Benson Municipal	Benson	0	4	6	8	9
	Bisbee Douglas Int'l	Douglas Bisbee	31	33	35	38	40
	Bisbee Municipal	Bisbee	10	11	12	12	13
	Bowie	Bowie	4	5	5	6	7
	Cochise College	Douglas	14	14	14	14	14
	Cochise County	Willcox	15	16	17	18	18
	Douglas Municipal	Douglas	29	30	30	31	32
	Sierra Vista Muni/Libby AAF	Ft. Huachuca	40	43	47	51	55
	Tombstone Municipal	Tombstone	0	0	0	0	0
Coconino			**219**	**239**	**260**	**283**	**311**
	Flagstaff-Pulliam	Flagstaff	120	132	144	158	174
	Grand Canyon Nat'l Park	Grand Canyon	53	58	63	68	74
	H.A. Clark Memorial Field	Williams	12	12	12	12	12
	Marble Canyon	Marble Canyon	1	1	1	1	2
	Page Municipal	Page	33	36	40	44	48
	Tuba City	Tuba City	0	0	0	0	0
	Valle Airport	Grand Canyon	0	0	0	0	0
Gila			**167**	**172**	**176**	**181**	**186**
	Payson	Payson	54	57	60	63	66
	Pleasant Valley International (Pvt)	Young	65	65	65	65	65
	San Carlos Apache	Globe	48	50	51	53	55
Graham			**34**	**36**	**38**	**41**	**43**
	Flying J Ranch	Pima	6	6	6	6	6
	Safford Regional	Safford	28	30	32	35	37
Greenlee			**4**	**4**	**4**	**4**	**4**
	Greenlee County	Clifton	4	4	4	4	4

Table 5-12: ***Forecast Total Based Aircraft by Airport 1998-2020 (continued)***

County	Airport	City	1998	2005	2010	2015	2020
LaPaz			**21**	**23**	**26**	**30**	**32**
	Avi Suquilla	Parker	18	18	19	20	20
	Quartzsite (New)	Quartzsite	3	5	7	10	12
Maricopa[1]			**3,857**	**4,065**	**4,303**	**4,568**	**4,877**
	Buckeye Municipal	Buckeye	74	95	122	156	200
	Chandler Municipal	Chandler	295	311	329	347	366
	Falcon Field	Mesa	923	958	996	1,034	1,074
	Forepaugh	Wickenburg	0	0	0	0	0
	Gila Bend Municipal	Gila Bend	2	2	3	3	3
	Glendale Municipal	Glendale	250	280	314	352	395
	Memorial Airfield	Chandler	61	66	70	76	81
	Phoenix Deer Valley Municipal	Phoenix	918	961	1,007	1,055	1,106
	Phoenix Goodyear Municipal	Goodyear	196	215	235	257	282
	Phoenix Sky Harbor Int'l	Phoenix	296	271	247	226	206
	Pleasant Valley	New River	65	75	87	100	116
	Scottsdale	Scottsdale	400	414	428	443	459
	Sky Ranch Carefree (Pvt.)	Carefree	139	150	162	174	188
	Stellar Airpark	Chandler	139	144	149	154	159
	Wickenburg Municipal	Wickenburg	39	44	50	56	63
	Williams Gateway	Phoenix	60	79	104	136	179
Mohave			**449**	**492**	**537**	**589**	**649**
	Colorado City Municipal	Colorado City	11	13	15	17	19
	Grand Canyon Bar-Ten	Whitmore	1	1	1	1	1
	Grand Canyon Caverns	Peach Springs	0	0	0	0	0
	Grand Canyon West	Meadview	0	0	0	0	0
	Kingman	Kingman	180	190	200	210	221
	Lake Havasu City Municipal	Lake Havasu City	184	204	226	250	277
	Laughlin/Bullhead International	Bullhead City	59	70	82	96	114
	Pearce Ferry	Meadview	0	0	0	1	2
	Sun Valley	Bullhead City	14	14	14	14	14
	Temple Bar	Temple Bar	0	0	0	0	1
	Tuweep	Tuweep	0	0	0	0	0
Navajo			**105**	**111**	**121**	**128**	**139**
	Holbrook Municipal	Holbrook	10	10	11	11	12
	Kayenta	Kayenta	3	3	3	3	3
	Mogollon Airpark	Overgaard	0	0	0	0	0
	Polacca	Polacca	4	4	4	4	5
	Shonto	Shonto	0	0	0	0	0
	Show Low Municipal	Show Low	47	52	58	64	71
	Taylor	Taylor	18	19	21	22	24
	Whiteriver	Whiteriver	8	8	8	8	8
	Winslow-Lindberg Regional	Winslow	15	15	16	16	16

[1] Based on *1993 MAG Regional Aviation System Plan*.

TABLE 5-12: ***Forecast Total Based Aircraft by Airport 1998-2020 (continued)***

County	Airport	City	1998	2005	2010	2015	2020
Pima[2]			**887**	**962**	**1,044**	**1,134**	**1,230**
	Ajo Municipal	Ajo	5	6	6	7	8
	Marana NW Regional	Tucson	216	234	254	276	299
	Ryan Field	Tucson	253	274	298	323	350
	Sells	Sells	1	1	1	2	2
	Tucson International	Tucson	412	447	485	526	571
Pinal			**216**	**231**	**248**	**267**	**284**
	Casa Grande Municipal	Casa Grande	59	62	66	70	74
	Coolidge Municipal	Coolidge	1	1	1	1	1
	Eloy Municipal	Eloy	39	41	44	47	49
	Estrella Sailport	Maricopa	23	24	26	28	293
	Grande Valley	Maricopa	0	0	0	0	0
	Kearny	Kearny	3	4	4	5	6
	Pinal Airpark	Marana	83	90	97	105	113
	San Manuel	San Manuel	8	9	10	11	12
	Superior Municipal	Superior	0	0	0	0	0
Santa Cruz			**23**	**26**	**29**	**32**	**36**
	Nogales International	Nogales	23	26	29	32	36
Yavapai			**439**	**494**	**556**	**627**	**708**
	Bagdad	Bagdad	14	17	22	27	33
	Cottonwood Municipal	Cottonwood	35	40	45	51	58
	Ernest A. Love Field	Prescott	290	323	360	401	446
	Sedona	Sedona	96	108	120	135	151
	Seligman	Seligman	4	6	9	13	20
Yuma			**95**	**104**	**114**	**125**	**137**
	Rolle Field	Somerton	0	0	0	0	0
	Yuma International	Yuma	95	104	114	125	137
State Total			**6,694**	**7,153**	**7,663**	**8,231**	**8,874**

Source: *BWR Corporation Forecast Analysis - 2001*

[2] From *PAG Regional Aviation System Plan*, using averages

TABLE 5-13: ***Forecast Based Single-Engine Aircraft by Airport 1998-2020***

County	Airport	City	1998	2005	2010	2015	2020
Apache			**30**	**33**	**36**	**39**	**43**
	Chinle Municipal	Chinle	2	2	3	3	4
	Ganado	Ganado	0	0	0	0	1
	St. Johns Industrial Airpark	St. Johns	9	10	10	11	11
	Town of Springerville Municipal	Springerville	15	16	17	18	19
	Window Rock	Window Rock	4	5	6	7	8
Cochise			**113**	**124**	**132**	**139**	**148**
	Benson Municipal	Benson	0	4	6	8	9
	Bisbee Douglas Int'l	Douglas Bisbee	25	27	29	30	33
	Bisbee Municipal	Bisbee	10	11	12	12	13
	Bowie	Bowie	4	5	5	6	6
	Cochise College	Douglas	13	13	13	13	13
	Cochise County	Willcox	13	14	15	15	16
	Douglas Municipal	Douglas	23	24	24	25	26
	Sierra Vista Muni/Libby AAF	Ft. Huachuca	25	27	28	30	32
	Tombstone Municipal	Tombstone	0	0	0	0	0
Coconino			**154**	**166**	**180**	**198**	**215**
	Flagstaff - Pulliam	Flagstaff	100	111	123	137	152
	Grand Canyon Nat'l Park	Grand Canyon	15	13	12	11	9
	H.A. Clark Memorial Field	Williams	12	12	12	12	12
	Marble Canyon	Marble Canyon	1	1	1	2	2
	Page Municipal	Page	26	29	32	36	40
	Tuba City	Tuba City	0	0	0	0	0
	Valle Airport	Grand Canyon	0	0	0	0	0
Gila			**104**	**108**	**112**	**117**	**132**
	Payson	Payson	54	57	60	63	67
	Pleasant Valley International (Pvt)	Young	10	10	10	10	10
	San Carlos Apache	Globe	40	41	42	44	45
Graham			**21**	**23**	**24**	**26**	**28**
	Safford Regional	Safford	21	23	24	26	28
Greenlee			**4**	**4**	**4**	**4**	**4**
	Greenlee County	Clifton	4	4	4	4	4
LaPaz			**18**	**18**	**19**	**19**	**20**
	Avi Suquilla	Parker	18	18	19	19	20
	Quartzsite (New)	Quartzsite	3	3	5	7	9

Note: Maricopa and Pima Counties not included.

TABLE 5-13: ***Forecast Based Single-Engine Aircraft by Airport 1998-2020 (continued)***

County	Airport	City	1998	2005	2010	2015	2020
Mohave			**309**	**339**	**374**	**412**	**456**
	Colorado City Municipal	Colorado City	10	11	13	15	17
	Grand Canyon Bar-Ten	Whitmore	0	0	0	0	0
	Grand Canyon Caverns	Peach Springs	0	0	0	0	0
	Grand Canyon West	Meadview	0	0	0	0	0
	Kingman	Kingman	80	85	91	97	103
	Lake Havasu City Municipal	Lake Havasu City	155	171	189	208	230
	Laughlin/Bullhead Int'l	Bullhead City	50	58	67	77	89
	Pearce Ferry	Meadview	0	0	0	1	2
	Sun Valley	Bullhead City	14	14	14	14	14
	Temple Bar	Temple Bar	0	0	0	0	1
	Tuweep	Tuweep	0	0	0	0	0
Navajo			**80**	**86**	**91**	**97**	**104**
	Holbrook Municipal	Holbrook	10	10	11	11	12
	Kayenta	Kayenta	3	3	3	3	3
	Mogollon Airpark	Overgaard	0	0	0	0	0
	Polacca	Polacca	3	4	4	4	4
	Show Low Municipal	Show Low	38	42	45	50	54
	Taylor	Taylor	10	11	12	13	14
	Whiteriver	Whiteriver	4	4	4	4	4
	Winslow-Lindberg Regional	Winslow	12	12	12	13	13
Pinal			**93**	**96**	**101**	**109**	**111**
	Casa Grande Municipal	Casa Grande	46	48	50	53	55
	Coolidge Municipal	Coolidge	1	1	1	1	2
	Eloy Municipal	Eloy	30	32	34	36	38
	Estrella Sailport	Maricopa	3	3	3	4	4
	Kearny	Kearny	2	2	3	3	4
	Pinal Airpark	Marana	0	0	0	1	1
	San Manuel	San Manuel	8	9	9	10	10
	Superior Municipal	Superior	0	0	0	0	1
	Three Point	Casa Grande	3	3	4	4	4
Santa Cruz			**15**	**17**	**20**	**22**	**26**
	Nogales International	Nogales	15	17	20	22	26
Yavapai			**397**	**446**	**503**	**566**	**640**
	Bagdad	Bagdad	14	17	21	25	31
	Cottonwood Municipal	Cottonwood	35	40	45	51	57
	Ernest A. Love Field	Prescott	257	286	320	357	398
	Sedona	Sedona	87	97	108	120	134
	Seligman	Seligman	4	6	9	13	20
Yuma			**78**	**86**	**94**	**103**	**113**
	Rolle Field	Somerton	0	0	0	0	0
	Yuma International	Yuma	78	86	94	103	113
State Total			**1,416**	**1,546**	**1,690**	**1,851**	**2,040**

Note: Maricopa and Pima Counties not included.

Source: *BWR Corporation Forecast Analysis - 2001*

TABLE 5-14: ***Forecast Based Multi-Engine Aircraft by Airport 1998-2020***

County	Airport	City	1998	2005	2010	2015	2020
Apache			**4**	**4**	**4**	**4**	**4**
	Chinle Municipal	Chinle	0	0	0	0	0
	Ganado	Ganado	0	0	0	0	0
	St. Johns Industrial Airpark	St. Johns	0	0	0	0	0
	Town of Springerville Municipal	Springerville	0	0	0	0	0
	Window Rock	Window Rock	4	4	4	4	4
Cochise			**18**	**19**	**19**	**20**	**21**
	Benson Municipal	Benson	0	0	0	0	0
	Bisbee Douglas Int'l	Douglas Bisbee	4	4	4	4	4
	Bisbee Municipal	Bisbee	0	0	0	0	0
	Bowie	Bowie	0	0	0	0	0
	Cochise College	Douglas	1	1	1	1	1
	Cochise County	Willcox	0	0	0	0	0
	Douglas Municipal	Douglas	4	4	4	4	4
	Sierra Vista Muni/Libby AAF	Ft. Huachuca	9	10	10	11	12
	Tombstone Municipal	Tombstone	0	0	0	0	0
Coconino			**28**	**30**	**32**	**35**	**38**
	Flagstaff-Pulliam	Flagstaff	18	19	20	21	22
	Grand Canyon Nat'l Park	Grand Canyon	6	7	8	10	12
	H.A. Clark Memorial Field	Williams	0	0	0	0	0
	Marble Canyon	Marble Canyon	0	0	0	0	0
	Page Municipal	Page	4	4	4	4	4
	Tuba City	Tuba City	0	0	0	0	0
	Valle Airport	Grand Canyon	0	0	0	0	0
Gila			**7**	**7**	**7**	**7**	**8**
	Payson	Payson	0	0	0	0	0
	Pleasant Valley International (Pvt)	Young	0	0	0	0	0
	San Carlos Apache	Globe	7	7	7	7	8
Graham			**7**	**7**	**8**	**8**	**8**
	Safford Regional	Safford	7	7	8	8	8
Greenlee			**0**	**0**	**0**	**0**	**0**
	Greenlee County	Glifton	0	0	0	0	0
LaPaz			**0**	**1**	**1**	**1**	**1**
	Avi Suquilla	Parker	0	0	0	0	0
	Quartzsite (New)	Quartzsite	0	1	1	1	1

Note: Maricopa and Pima Counties not included.

TABLE 5-14: ***Forecast Based Multi-Engine Aircraft by Airport 1998-2020 (continued)***

County	Airport	City	1998	2005	2010	2015	2020
Mohave			**128**	**134**	**142**	**150**	**160**
	Colorado City Municipal	Colorado City	1	1	2	2	2
	Grand Canyon Bar-Ten	Whitmore	0	0	0	0	0
	Grand Canyon Caverns	Peach Springs	0	0	0	0	0
	Grand Canyon West	Meadview	0	0	0	0	0
	Kingman	Kingman	92	92	92	92	92
	Lake Havasu City Municipal	Lake Havasu City	26	29	32	35	39
	Laughlin/Bullhead Int'l	Bullhead City	9	12	16	21	27
	Pearce Ferry	Meadview	0	0	0	0	0
	Sun Valley	Bullhead City	0	0	0	0	0
	Temple Bar	Temple Bar	0	0	0	0	0
	Tuweep	Tuweep	0	0	0	0	0
Navajo			**21**	**22**	**23**	**27**	**29**
	Holbrook Municipal	Holbrook	0	0	0	0	0
	Kayenta	Kayenta	0	0	0	0	0
	Mogollon Airpark	Overgaard	0	0	0	0	0
	Polacca	Polacca	1	1	1	1	1
	Show Low Municipal	Show Low	9	10	12	14	16
	Taylor	Taylor	8	8	9	9	9
	Whiteriver	Whiteriver	0	0	0	0	0
	Winslow-Lindberg Regional	Winslow	3	3	3	3	3
Pinal			**15**	**15**	**16**	**16**	**17**
	Casa Grande Municipal	Casa Grande	7	7	8	8	9
	Coolidge Municipal	Coolidge	0	0	0	0	0
	Eloy Municipal	Eloy	7	7	7	7	7
	Estrella Sailport	Maricopa	0	0	0	0	0
	Kearny	Kearny	1	1	1	1	1
	Pinal Airpark	Marana	0	0	0	0	0
	San Manuel	San Manuel	0	0	0	0	0
	Superior Municipal	Superior	0	0	0	0	0
Santa Cruz			**8**	**9**	**10**	**11**	**12**
	Nogales International	Nogales	8	9	10	11	12
Yavapai			**38**	**42**	**47**	**52**	**57**
	Bagdad	Bagdad	0	0	0	0	0
	Cottonwood Municipal	Cottonwood	0	0	0	0	0
	Ernest A. Love Field	Prescott	32	35	39	43	47
	Sedona	Sedona	6	7	8	9	10
	Seligman	Seligman	0	0	0	0	0
Yuma			**16**	**17**	**19**	**21**	**22**
	Rolle Field	Somerton	0	0	0	0	0
	Yuma International	Yuma	16	17	19	21	22
State Total			**290**	**307**	**328**	**352**	**377**

Note: Maricopa and Pima Counties not included.

Source: *BWR Corporation Forecast Analysis - 2001*

TABLE 5-15: ***Forecast Based Other Aircraft by Airport 1998-2020***

County	Airport	City	1998	2005	2010	2015	2020
Apache			**1**	**1**	**1**	**1**	**2**
	Chinle Municipal	Chinle	0	0	0	0	0
	Ganado	Ganado	0	0	0	0	0
	St. Johns Industrial Airpark	St. Johns	0	0	0	0	0
	Town of Springerville Municipal	Springerville	1	1	1	1	1
	Window Rock	Window Rock	0	0	0	0	1
Cochise			**12**	**13**	**14**	**16**	**18**
	Benson Municipal	Benson	0	0	0	0	0
	Bisbee Douglas Int'l	Douglas Bisbee	2	2	2	2	2
	Bisbee Municipal	Bisbee	0	0	0	0	0
	Bowie	Bowie	0	0	0	0	0
	Cochise College	Douglas	0	0	0	0	0
	Cochise County	Willcox	2	2	2	2	2
	Douglas Municipal	Douglas	2	2	2	2	2
	Sierra Vista Muni/Libby AAF	Ft. Huachuca	6	7	8	10	12
	Tombstone Municipal	Tombstone	0	0	0	0	0
Coconino			**37**	**42**	**47**	**54**	**61**
	Grand Canyon Nat'l Park	Grand Canyon	32	37	42	49	56
	H.A. Clark Memorial Field	Williams	0	0	0	0	0
	Marble Canyon	Marble Canyon	0	0	0	0	0
	Page Municipal	Page	3	3	3	3	3
	Flagstaff-Pulliam	Flagstaff	2	2	2	2	2
	Tuba City	Tuba City	0	0	0	0	0
	Valle Airport	Grand Canyon	0	0	0	0	0
Gila			**56**	**56**	**56**	**56**	**56**
	Payson	Payson	0	0	0	0	0
	Pleasant Valley International (Pvt)	Young	55	55	55	55	55
	San Carlos Apache	Globe	1	1	1	1	1
Graham			**0**	**0**	**0**	**0**	**0**
	Safford Regional	Safford	0	0	0	0	0
Greenlee			**0**	**0**	**0**	**0**	**0**
	Greenlee County	Clifton	0	0	0	0	0
LaPaz			**0**	**1**	**1**	**2**	**2**
	Avi Suquilla	Parker	0	0	0	0	0
	Quartzsite (New)	Quartzsite.	0	1	1	2	2

Note: Maricopa and Pima Counties not included.

TABLE 5-15: ***Forecast Based Other Aircraft by Airport 1998-2020 (continued)***

County	Airport	City	1998	2005	2010	2015	2020
Mohave			**12**	**13**	**14**	**16**	**18**
	Colorado City Municipal	Colorado City	0	0	0	0	0
	Grand Canyon Bar-Ten	Whitmore	1	1	1	1	1
	Grand Canyon Caverns	Peach Springs	0	0	0	0	0
	Grand Canyon West	Meadview	0	0	0	0	0
	Kingman	Kingman	8	8	8	8	8
	Lake Havasu City Municipal	Lake Havasu City	3	4	5	7	9
	Laughlin/Bullhead Int'l	Bullhead City	0	0	0	0	0
	Pearce Ferry	Meadview	0	0	0	0	0
	Sun Valley	Bullhead City	0	0	0	0	0
	Temple Bar	Temple Bar	0	0	0	0	0
	Tuweep	Tuweep	0	0	0	0	0
Navajo			**1**	**1**	**1**	**1**	**1**
	Holbrook Municipal	Holbrook	0	0	0	0	0
	Kayenta	Kayenta	0	0	0	0	0
	Mogollon Airpark	Overgaard	0	0	0	0	0
	Polacca	Polacca	0	0	0	0	0
	Show Low Municipal	Show Low	0	0	0	0	0
	Taylor	Taylor	0	0	0	0	0
	Whiteriver	Whiteriver	1	1	1	1	1
	Winslow-Lindberg Regional	Winslow	0	0	0	0	0
Pinal			**111**	**116**	**124**	**129**	**137**
	Casa Grande Municipal	Casa Grande	6	6	7	7	7
	Coolidge Municipal	Coolidge	0	0	0	0	0
	Eloy Municipal	Eloy	2	2	2	2	2
	Estrella Sailport	Maricopa	20	21	23	24	26
	Kearny	Kearny	0	0	0	0	0
	Pinal Airpark	Marana	83	87	92	96	101
	San Manuel	San Manuel	0	0	0	0	0
	Superior Municipal	Superior	0	0	0	0	0
Santa Cruz			**0**	**0**	**0**	**0**	**0**
	Nogales International	Nogales	0	0	0	0	0
Yavapai			**4**	**5**	**5**	**6**	**8**
	Bagdad	Bagdad	0	0	0	0	0
	Cottonwood Municipal	Cottonwood	0	0	0	0	0
	Ernest A. Love Field	Prescott	1	1	1	1	2
	Sedona	Sedona	3	4	4	5	6
	Seligman	Seligman	0	0	0	0	0
Yuma			**1**	**1**	**1**	**1**	**1**
	Rolle Field	Somerton	0	0	0	0	0
	Yuma International	Yuma	1	1	1	1	1
State Total			**235**	**249**	**264**	**282**	**304**

Note: Maricopa and Pima Counties not included.

Source: *BWR Corporation Forecast Analysis - 2001*

TABLE 5-16: ***General Aviation Operations Forecast by Airport 1998-2020***

County	Airport	City	1998	2005	2010	2015	2020
Apache			**27,330**	**29,094**	**31,183**	**33,541**	**36,227**
	Chinle Municipal	Chinle	900	1,184	1,559	2,051	2,700
	Ganado	Ganado	700	700	700	700	700
	St. Johns Industrial Airpark	St. Johns	15,100	15,700	16,432	17,199	18,001
	Town of Springerville Municipal	Springerville	8,580	9,072	9,593	10,144	10,726
	Window Rock	Window Rock	2,050	2,438	2,899	3,447	4,100
Cochise			**115,280**	**117,298**	**125,418**	**130,870**	**136,473**
	Benson Municipal	Benson	200	800	1,200	1,600	1,800
	Bisbee Douglas Int'l	Douglas Bisbee	32,000	34,170	36,487	38,961	41,603
	Bisbee Municipal	Bisbee	1,806	1,941	2,085	2,241	2,408
	Bowie	Bowie	100	114	129	147	167
	Cochise College	Douglas	45,250	45,250	45,250	45,250	45,250
	Cochise County	Willcox	7,096	7,474	7,872	8,291	8,733
	Douglas Municipal	Douglas	11,100	11,368	11,641	11,923	12,210
	Sierra Vista Muni/Libby AAF	Ft. Huachuca	17,528	18,981	20,554	22,257	24,102
	Tombstone Municipal	Tombstone	200	200	200	200	200
Coconino			**272,293**	**296,293**	**322,496**	**351,105**	**382,342**
	Flagstaff-Pulliam	Flagstaff	63,400	69,556	76,310	83,720	91,849
	Grand Canyon Nat'l Park	Grand Canyon	164,479	178,916	194,621	211,703	230,286
	H.A. Clark Memorial Field	Williams	3,600	3,600	3,600	3,600	3,600
	Marble Canyon	Marble Canyon	2,340	2,590	2,866	3,172	3,510
	Page Municipal	Page	31,988	35,145	38,613	42,424	46,611
	Tuba City	Tuba City	6,486	6,486	6,486	6,486	6,486
	Valle Airport	Grand Canyon	NA	NA	NA	NA	NA
Gila			**89,200**	**91,036**	**92,957**	**94,965**	**97,066**
	Payson	Payson	25,000	26,260	27,584	28,974	30,435
	Pleasant Valley International (Pvt)	Young	48,000	48,000	48,000	48,000	48,000
	San Carlos Apache	Globe	16,200	16,776	17,373	17,991	18,631
Graham			**15,550**	**16,618**	**17,763**	**18,991**	**20,308**
	Flying J Ranch	Pima	800	800	800	800	800
	Safford Regional	Safford	14,750	15,818	16,963	18,191	19,508
Greenlee			**7,800**	**7,800**	**7,800**	**7,800**	**7,800**
	Greenlee County	Clifton	7,800	7,800	7,800	7,800	7,800
LaPaz			**14,600**	**15,387**	**16,186**	**17,195**	**18,015**
	Avi Suquilla	Parker	14,000	14,387	14,786	15,195	15,615
	Quartzsite (New)	Quartzsite	600	1,000	1,400	2,000	2,400

Note: Includes only general aviation operations.

TABLE 5-16: ***General Aviation Operations Forecast by Airport 1998-2020 (continued)***

County	Airport	City	1998	2005	2010	2015	2020
Maricopa[3]			**1,981,663**	**2,072,791**	**2,196,123**	**2,370,860**	**2,604,341**
	Buckeye Municipal	Buckeye	16,020	21,069	27,708	36,440	47,924
	Chandler Municipal	Chandler	153,800	163,604	174,034	185,128	196,929
	Falcon Field	Mesa	220,969	233,156	246,016	259,584	273,902
	Forepaugh	Wickenburg					
	Gila Bend Municipal	Gila Bend	1,580	1,678	1,783	1,894	2,012
	Glendale Municipal	Glendale	150,000	166,340	184,460	204,553	226,836
	Memorial Airfield	Chandler	25,500	46,348	84,239	153,109	278,283
	Phoenix Deer Valley	Phoenix	281,124	300,333	320,855	342,779	366,201
	Phoenix Goodyear Muni	Goodyear	140,000	152,640	166,421	181,447	197,829
	Phoenix Sky Harbor Int'l	Phoenix	537,822	498,587	462,214	428,495	397,236
	Pleasant Valley	New River	48,000	55,587	64,373	74,547	86,330
	Rio Vista Hills	Wickenburg	200	200	200	200	200
	Scottsdale	Scottsdale	182,153	186,790	195,000	210,000	240,000
	Sky Ranch Carefree (Pvt)	Carefree	5,400	5,800	6,200	6,700	7,200
	Stellar Airpark	Chandler	41,020	42,133	43,276	44,450	45,656
	Wickenburg Municipal	Wickenburg	8,475	9,226	10,044	10,934	11,903
	Williams Gateway	Phoenix	169,600	189,300	209,300	230,600	225,900
Mohave			**145,790**	**163,156**	**183,004**	**205,727**	**231,783**
	Colorado City Municipal	Colorado City	3,680	4,233	4,869	5,600	6,441
	Grand Canyon Bar-Ten	Whitmore	2,000	2,000	2,000	2,000	2,000
	Grand Canyon Caverns	Peach Springs	700	700	700	700	700
	Grand Canyon West	Meadview	NA	NA	NA	NA	NA
	Kingman	Kingman	33,000	34,747	36,586	38,523	40,563
	Lake Havasu City Municipal	Lake Havasu City	55,344	61,304	67,906	75,220	83,320
	Laughlin/Bullhead Int'l	Bullhead City	47,316	55,746	65,679	77,382	91,170
	Pearce Ferry	Meadview	1,100	1,308	1,556	1,850	2,200
	Sun Valley	Bullhead City	750	750	750	750	750
	Temple Bar	Temple Bar	1,800	2,268	2,858	3,602	4,539
	Tuweep	Tuweep	100	100	100	100	100

Note: Includes only general aviation operations.

[3] Based on *MAG Regional Aviation System Plan.*

TABLE 5-16: ***General Aviation Operations Forecast by Airport 1998-2020 (continued)***

County	Airport	City	1998	2005	2010	2015	2020
Navajo			**81,470**	**85,622**	**90,149**	**95,098**	**100,481**
	Holbrook Municipal	Holbrook	4,650	4,815	4,987	5,164	5,348
	Kayenta	Kayenta	4,700	4,700	4,700	4,700	4,700
	Mogollon Airpark	Overgaard	200	200	200	200	200
	Polacca	Polacca	5,300	5,300	5,300	5,300	5,300
	Show Low Municipal	Show Low	29,170	32,282	35,726	39,538	43,756
	Taylor	Taylor	4,800	5,158	5,542	5,956	6,400
	Whiteriver	Whiteriver	5,000	5,000	5,000	5,000	5,000
	Winslow-Lindberg Regional	Winslow	27,650	28,167	28,694	29,230	29,777
Pima[4]			**508,565**	**551,880**	**598,899**	**649,941**	**705,357**
	Ajo Municipal	Ajo	1,500	1,660	1,837	2,033	2,250
	Marana NW Regional	Tucson	71,300	77,336	83,883	90,984	98,687
	Pinal Airpark	Marana	10,368	11,204	12,107	13,083	14,138
	Ryan Field	Tucson	157,659	171,045	185,567	201,322	218,415
	Sells	Sells	1,310	1,558	1,853	2,203	2,620
	Tucson International	Tucson	266,428	289,077	313,652	340,316	369,247
Pinal			**129,468**	**138,212**	**147,699**	**158,038**	**169,370**
	Casa Grande Municipal	Casa Grande	65,400	69,152	73,120	77,315	81,750
	Coolidge Municipal	Coolidge	8,500	9,318	10,215	11,199	12,277
	Eloy Municipal	Eloy	23,100	24,514	26,015	27,607	29,297
	Estrella Sailport	Maricopa	16,500	17,522	18,606	19,758	20,981
	Grande Valley	Maricopa					
	Kearny	Kearny	4,200	4,995	5,940	7,064	8,401
	Pinal Airpark	Marana	10,368	11,017	11,707	12,440	13,219
	San Manuel	San Manuel	1,000	1,096	1,202	1,318	1,445
	Superior Municipal	Superior	400	598	894	1,337	2,000
Santa Cruz			**22,890**	**27,602**	**33,283**	**40,133**	**48,394**
	Nogales International	Nogales	22,890	27,602	33,283	40,133	48,394
Yavapai			**428,809**	**480,450**	**538,689**	**604,493**	**679,020**
	Bagdad	Bagdad	14,000	17,380	21,576	26,785	33,251
	Cottonwood Municipal	Cottonwood	19,410	22,003	24,942	28,273	32,050
	Ernest A. Love Field	Prescott	353,299	393,494	438,261	488,121	543,655
	Sedona	Sedona	41,000	45,928	51,450	57,636	64,564
	Seligman	Seligman	1,100	1,645	2,460	3,678	5,500
Yuma			**39,964**	**43,300**	**46,954**	**50,956**	**55,338**
	Rolle Field	Somerton	4,900	4,900	4,900	4,900	4,900
	Yuma International	Yuma	35,064	38,400	42,054	46,056	50,438
State Total			**3,880,672**	**4,136,539**	**4,448,603**	**4,829,703**	**5,342,315**

Note: Includes only general aviation operations.

Source: *BWR Corporation Forecast Analysis - 2001*

[4] From *PAG Regional Aviation System Plan*.